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DISEASES OF CHILDREN

HATFIELD.

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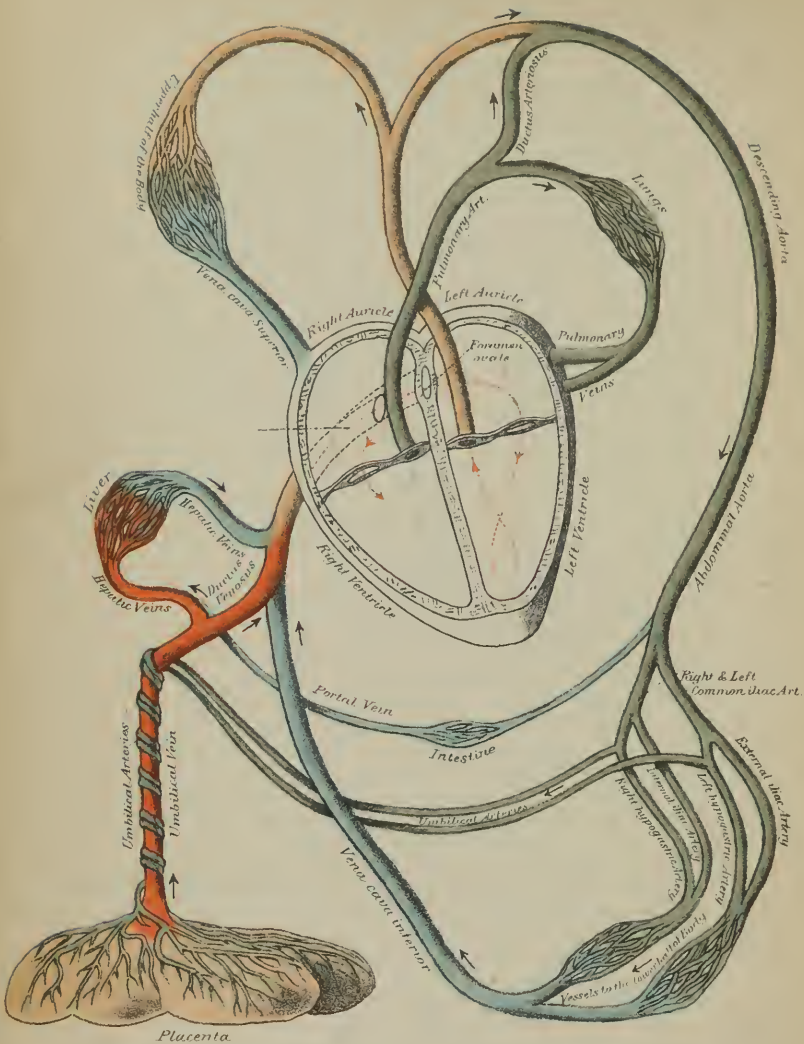


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MARCUS P. ~~HAT~~FIELD, A.M., M.D.,

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TO
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MY BEST AND MOST ENTHUSIASTIC TEACHER IN
PEDIATRICS,
THIS LITTLE COMPEND IS GRATEFULLY
DEDICATED BY
ITS COMPILER.



PREFACE TO SECOND EDITION.

This little book is founded upon Dr. Ernst Kormann's excellent "Compendium der Kinderkrankheiten," translated many years ago with the coöperation of Dr. E. J. Doering, while fellow students at the University of Berlin. This joint translation in time became the basis of an annual course of lectures delivered at the Chicago Medical College, and these lectures recondensed have furnished the material for this Compend. At this date it would be difficult, if not impossible, to state exactly how much credit should revert to Henoch, Kormann, Bouchut, Baginsky, Steiner and others, all of whom were drawn upon freely in the preparation of these lectures, and in a work of this character, individual acknowledgment has not been attempted except in case of direct quotation.

Unstinted assistance has been freely given by Dr. R. Engleman, and Dr. Eva McClanahan, without whose aid the preparation of this work would have been impossible, with the other demands of a professional life.

M. P. H.

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A COMPEND OF THE DISEASES OF CHILDREN.

SECTION I.

ANATOMY AND PHYSIOLOGY.

1. **The Circulation** of blood in the fetus is as follows : From the placenta, through the umbilical vein, which enters the body at the umbilical ring and passes to the under side of the liver. Here the current divides, a part going through the ductus venosus (see plate opposite) directly into the inferior vena cava (vena cava ascendens) ; the remainder enters the portal vein and, as in the circulation of adult life, passes through the liver, before entering the vena cava ascendens, and through it to the right auricle. Here the currents of the descending and ascending venæ cavæ join, but do not coalesce, being separated by the Eustachian valve ; consequently the bulk of the blood which enters the right auricle through the inferior vena cava does not follow the course of the adult circulation, but flows directly into the left auricle, through the *foramen ovale*, and thence into the left ventricle and aorta, as in the adult. The course of the current entering the right auricle from the superior vena cava (descendens) is quite different, for this blood, in the main, passes through the tricuspid valve into the right ventricle, and thence into the pulmonary artery, as in the adult ; but, unlike the adult, the bulk of this blood never reaches

the lungs, but passes directly into the aorta by the *ductus arteriosus* (Botalli), which passes from the pulmonary artery to the aorta, entering below the origin of the great vessels. A small portion of blood flows past the ductus arteriosus into the lungs, via the pulmonary arteries, just sufficient for the growth and nourishment of the lungs, then passes through them, and, as in the adult, enters the left auricle, where it is mingled with the blood entering the same cavity, via the foramen ovale, as described above, and follows subsequently the course of the adult circulation, until it at last enters the umbilical arteries, which are given off by the hypogastric arteries, and which convey venous blood directly from the fetus to the placenta.

2. The changes in the **fetal circulation** which occur at birth are as follows :—

(a) Disuse of the ductus arteriosus, owing to the expansion of the lungs bending and thus obstructing this duct and relieving aortic pressure, with coincident closure of the foramen ovale. Neither the foramen ovale nor the ductus arteriosus become completely impervious immediately after birth, for the first may remain open for a month, and the ductus often is not entirely closed until the third month.

(b) Obliteration of the arteria umbilicales, in which, immediately after the detachment of the placenta, thrombi form, owing to the lessening of arterial pressure. The umbilical arteries thus occluded are later transformed into the lateral ligaments of the bladder.

(c) Thrombosis of the umbilical vein similarly follows the detachment of the placenta. This thrombosis extends past the umbilical ring to the bifurcation of the umbilical vein at the end of the transverse fissure of the liver, and fills the ductus venosus (Arantii) with a clot which eventually converts it into the ligamentum teres of the liver.

3. **Pulse** at birth 130–150 per minute, irregular and very easily disturbed by slight causes ; at end of first year, 100–120 ; second year, 100 ; fifth year about 90. Pulmonary blood pressure in the child is greater than in the adult.

4. **Respiration** varies with age and is easily disturbed ; at birth, 40 per minute ; from two months to two years, 25–35 ; from

two to twelve years, 18 when sleeping and about 24 when awake. A well child ought to breathe through its nose, keeping its lips closed. Pulmonary excretion of carbon dioxide in the child is nearly double that of the adult in comparison with the body weight.

5. **The Stomach** of the newborn child is almost without a fundus and lies nearly vertical. At birth it holds less than 2 ozs. (40–50 c.c.), and serves, according to Traube, mainly as a place for the coagulation of the milk, which passes through the pylorus otherwise little changed. Vaughan's experiments seem to show that the digestion of milk in the infant is accomplished almost entirely in the small intestine by the aid of the pancreatic fluids, whose activity is well developed in the newborn. The proper nourishment of the young child calls for relatively more albuminoids and fats than the adult and less carbohydrates. See feeding, where a fuller discussion of the action of the digestive ferments may be found.

6. **The Feces**, with an exclusively milk diet, should have a bright mustard-yellow color, are of the consistence of ointment, feebly acid, and contain about 85 per cent. of water, white flecks of fat, calcic lactates, traces of bilirubin, intestinal epithelial cells, and mucous bacteria. These bacteria have not yet been fully studied and differentiated, but the bacterium *lactis aerogenes*, and various micrococci, seem to be fairly constant. 100 parts milk diet should produce about three parts of feces on an average.

7. **Meconium** is the name given the dark-green feces first passed by the newborn child, from their resemblance to inspissated poppy juice. Meconium is viscid, odorless, feebly acid, and consists of partially digested amniotic fluid, epidermal cells, fine hairs, cholesterin crystals, and intestinal epithelial cells, but contains no products of decomposition nor bacteria when first voided.

8. **Urine** is secreted in utero, and is voided both before and often during the act of birth. The kidneys are relatively large at birth, and often show a peculiar reddish discoloration of their papillæ, produced by a deposit of uric acid crystals and urates, especially well marked in those children whose supply of oxygen has been deficient at birth. This is the so-called uric acid infarct, and is of little pathological significance. The *quantity* of urine increases rapidly for the first five days, after that more slowly. At first

it averages from 12-13 ozs. (417 c.c.); after two years it reaches 15 ozs. (500 c.c.), rising to 18-19 ozs. (600 c.c.) at four years. The specific gravity of the urine increases up to the tenth day, after that it slightly diminishes. Average specific gravity, 1005-1010. The urine of early life is often turbid, dark, and acid; later it becomes clear straw yellow and generally neutral in reaction. The excretion of urea is relatively less in children than in adults, and still less relatively are the phosphates. The same is true of chlorid of sodium.

9. **Temperature** at birth is 99° F. (37.7° C.), falling in a few hours a degree or more Centigrade (37.7°-36.2°), but rising again within thirty-six hours to about its initial height. The temperature in a young child is best taken in the anus or vagina; and it should be remembered that comparatively trifling causes in infants may produce relatively great variations in temperature, especially through depressing agents. In general, the temperature rises during the forenoon, reaches its highest point in the afternoon, begins to sink about six, and reaches its minimum in the early morning hours, shortly after midnight. It should also be remembered that in very young children the temperature may mark high (105-106°) without necessarily grave results, except in those predisposed to eclampsia.

Aphorism I.—Lowered temperature is found in anemia, profuse hemorrhage, collapse, death agony, and sclerema neonatorum, hydrocephaloid, and in children prematurely born. In early infancy there is no absolute relation between organic lesions and the height of temperature observed, for high fever, great restlessness, and even convulsions may disappear quickly, and leave absolutely no lesions behind. (Bouchut.)

Aphorism II.—A temperature above 100° (37.8-38° C.) during the first four days of life is pathological. The same is true of rise of temperature during sleep.

Aphorism III.—The morning and evening differences in temperature in the fevers of children are, as a rule, greater than in the adult.

Aphorism IV.—High febrile heat with sudden chilling of the extremities is one of the frequent phenomena of fever in very young children.

10. **The Skin** of a newborn child is more or less covered with a smeary, white substance (*Vernix caseosa*), readily soluble in lard or vaselin, before the first bath, after which the surface of the child's body, if healthy, appears reddened, delicate in texture, and covered with fine hairs. During the first week of life a quite extensive exfoliation of the epidermis takes place. The hair with which the head of the child was covered at birth gradually falls out and is succeeded by an after growth.

11. **The Sudoriferous Glands** secrete but little during the first weeks of life. The mammary glands of the newborn are not infrequently found in a state of congestion and enlargement in both sexes, often sufficient to produce in them a few drops of a milky secretion ("Hexenmilch," see *Mastitis*).

12. **Dentition** commences usually at the seventh month, but it may be deferred till the twelfth to the eighteenth month, even to the second year, especially in rickets. When a child is born with teeth, they usually fall out early. The temporary teeth (twenty in number) are generally cut in pairs. The following table indicates, in months, the usual time of their appearance, above and below, thus:—

| <i>Molars.</i> | <i>Canine.</i> | <i>Incisors.</i> | <i>Canine.</i> | <i>Molars.</i> |
|----------------|----------------|------------------|----------------|----------------|
| 24-12 | 18 | 9-7-7-9 | 18 | 12-24 |

The lower teeth usually are a little in advance of the upper. The permanent (thirty-two in number) appear in years as follows:—

PERMANENT TEETH.

| 23-13-6 (Molars) | | (Molars) 6-13-23 | | |
|------------------|----------------|------------------|----------------|------------------|
| <i>Bicuspid.</i> | <i>Canine.</i> | <i>Incisors.</i> | <i>Canine.</i> | <i>Bicuspid.</i> |
| 10-9 | 11 | 8-7-7-8 | 11 | 9-10 |

13. **Saliva.**—The earliest saliva secreted by the infant is small in quantity and deficient in ptyaline, the starch-converting power of the infant up to the sixth or seventh month residing in the pancreatic diastase. After the sixth month the infant's saliva has properties similar to that of the adult, although not fully developed until after dentition.

14. **The Lacrymal Glands** secrete very sparingly during the first few weeks of life; the **sebaceous glands** often continue their interuterine activity, especially those of the hairy scalp. (See *Seborrhea*.)

15. **The Thymus Gland** at birth lies immediately posterior to the manubrium in the anterior mediastinum, and consists of a long, flattened, lobulated body, to which are laterally attached two unequal lobes, which closely resemble in structure the salivary glands, but are subject to extraordinary variations in size. Its uses are unknown, and it normally diminishes in size from the second year to puberty, when it should have disappeared. Morphologically it consists of a long tube to which the primary nodules are attached, like knots on a rope. Each lobule contains a cavity communicating with a larger central cavity—the reservoir of the thymus—which contains a whitish fluid in which float numerous corpuscles similar to those found in the chyle.

16. **The Growth of the Child.**—The average length of the newborn child is 18 inches (50 cm. for boys and 49 cm. for girls), and its weight about one-thirtieth that of its adult weight (3300 grams).

The increase in the length of the child's skeleton is most rapid during the earlier months of its life, decreasing with each year up to the fifth in about the following ratio: first year, 16–20 cm. (5–7 inches); second year, 10 cm.; third year, 7.5 cm.; fourth year, 6.5 cm., and during the fifth year to the sixteenth or eighteenth year there is a yearly increase of 5 cm. (1½ inches); after 18 this growth decreases to 3–4 cm. per annum until the full growth is attained, between the twentieth and twenty-fourth years.

Growth is retarded by poor nourishment, impure air, and certain diseases of nutrition, such as scrofula, etc. On the other hand, certain exanthemata and other as yet unknown conditions have the power at times of greatly accelerating growth, but such rapidly growing children are apt to become feeble and require especially good food, much rest, and relief from their studies.

The smaller **Fontanelle** closes immediately after birth, but the anterior fontanelle remains normally open until the middle or the end of the second year. According to Elsasser the width of

the great fontanelle increases up to the ninth month of infancy, for the reason that the edges of the fontanelle can only increase in like measure with the sutures forming the fontanelle, for otherwise the borders of the fontanelle must grow more rapidly than the sutures and cranium in general. The sutures begin to coalesce about the ninth month and after that the fontanelle lessens in size. The reason of the late coalescence of the sutures is the enormous development of the brain during the first months of life. The tension observed in the still open fontanelle often affords valuable aid in diagnosis, *e. g.*:—

Aphorism V.—Protuberance of the fontanelle indicates hyperemia of the brain, or exudation into the same, most marked in hydrocephalus. Depression of the fontanelle implies cerebral anemia, and is found in hydrocephaloid, general atrophy, or the collapse of cholera morbus and Asiatic cholera.

Growth of the Head.—The average circumference of the head at birth is 13 inches (34 cm.), its long diameter 11.2. The increase in the long diameter up to the third year is 4.5 cm., during the next four years 2.3 cm. more, the full development of the cranium being about completed by the end of the seventh year.

17. Weight.—The weight of the fully developed child at birth is about 3500 grams for boys, and 3200 for girls. During the first three or four days there is a loss of about 200 grams (average 222, or 6.5 per cent. to 6.9 per cent.), which is regained by the twelfth day, and usually trebled during the first year. Hahner's observations show that the increase in a child's weight is not regular, but irregular, though the most rapid gain takes place, as a rule, in the second month of life, though it may occur in the fourth. According to Russow, there is a marked difference in the growth of children who are nursed by their mothers and those who are bottle-fed, for the children of the first double their weight in five months and treble it within twelve, while children who are artificially fed require two years to produce a similar increase in weight. The advantages gained by children that are nursed are apparent as late as the eighth year, when, according to Russow, children who have been nursed at the breast still show on an average a gain of 2000 grams over those artificially fed. The

following table taken from Uffelman shows the relative increase in weight for boys and girls, for each from 1 to 15 years:—

| | <i>Grams.</i> | <i>Grams.</i> |
|-------------------------------------|---------------|-----------------|
| Weight at birth, boy, | 3,500 | 3,200 for girl. |
| End of first year, “ | 10,000 | 9,500 “ “ |
| End of second year, “ | 12,000 | 11,500 “ “ |
| End of third year, “ | 13,200 | 12,750 “ “ |
| End of fourth year, “ | 15,000 | 14,500 “ “ |
| End of fifth year, “ | 16,750 | 16,000 “ “ |
| End of sixth year, “ | 18,200 | 17,600 “ “ |
| End of seventh year, “ | 20,000 | 19,150 “ “ |
| End of eighth year, “ | 21,750 | 20,800 “ “ |
| End of ninth year, “ | 23,200 | 22,300 “ “ |
| End of tenth year, “ | 25,000 | 24,200 “ “ |
| End of eleventh year, “ | 27,600 | 26,600 “ “ |
| End of twelfth year, “ | 31,000 | 30,600 “ “ |
| End of thirteenth year “ | 35,300 | 33,800 “ “ |
| End of fourteenth year, “ | 39,000 | 36,700 “ “ |
| End of fifteenth year, “ | 45,000 | 41,500 “ “ |

Nervous System.—Uffelman well describes the newborn child as a reflex automaton (Rückenmarkindividuum), for it requires weeks and months to develop its higher nervous organism, during which period its nervous system is in an easily disturbed condition. Hence its uncertain equilibrium as shown in the twitchings of fever, the frequent chorea, and convulsions of childhood.

SECTION II.

THE PHYSIOLOGICAL AND TRAUMATIC ACCIDENTS OF BIRTH.

The physiological accidents of birth arise from any interference with the physiological changes normally occurring in the child's organism at time of birth. The more important of these changes are:—

First. The establishment of pulmonary respiration forces a stronger current of blood into the pulmonary artery than formerly, hence the blood no longer passes into the aorta by the prenatal duct—*ductus arteriosus Botalli*. This duct passes from the pulmonary artery, before it branches, to the arch of the aorta and is, therefore, the prenatal short cut for the blood, thus enabling it to escape the pulmonary circulation. At the time of birth the expansion of the lungs changes the position of this duct, which thus becomes bent and obliterated in the course of a few weeks.

Second. The accumulation of carbon dioxid in the blood of the newborn stimulates the respiratory centers and the expansion of the lungs. This causes no inconsiderable pressure on the heart and blood-vessels of the thorax, whereby more blood is forced into the pulmonary artery, relieving the pressure existing in the aortic system during the fetal life. The most evident result of this diminished pressure is found in the arteries of the umbilical cord, which cease to pulsate. These *arteria umbilicales* are the largest branches of the hypogastric arteries, being given off at the side of the bladder, and passing upward and outward of the umbilical ring into the cord and thence to the placenta. After the placenta is detached from the uterus, thrombi form in the umbilical arteries nearly up to their origin in the hypogastrics. These thrombi later become organized, and form, with the obliterated arteries, the lateral ligaments of the bladder.

Third. At the same time that the umbilical arteries become obliterated by the detachment of the placenta the umbilical vein is also deprived of the supply of blood, which it previously carried through the umbilical ring to the liver and through its anterior longitudinal fissure to the left end of its transverse fossa, where the umbilical vein divides *into two branches*. By one of these it sends the greater part of its blood into the left branch of the portal vein, by the other, under the name of the *ductus venosus*, it carries the remainder of the blood into the inferior vena cava. Both the duct and the umbilical vein are obliterated after their circulation is cut off, the latter becoming the *ligamentum teres* of the liver. As a result of the obliteration of the umbilical veins and the *ductus venosus*, the ramifications of the portal vein are filled with more blood in the same measure as the rapid flow into the vena cava inferior

is checked through its former channels. If the portal capillaries have from any reason become weakened, they may give way, and we have hemorrhage into the intestines, or more rarely into the stomach. (See *Melena neonatorum*.)

APNEA NEONATORUM.

Synonym.—Physiological apnea.

Definition.—Physiological apnea is tardiness in beginning respiration, placental circulation persisting for some time after birth, and the cord pulsating for an undue length of time, the child dying from heart failure.

Etiology.—Failure of respiratory centers to promptly respond to their usual stimuli of cold, etc., hence the child continues in the state of physiological apnea in which it was before birth.

Prognosis.—Hopeless, if persistent.

Treatment.—(See *Asphyxia neonatorum*.)

ASPHYXIA NEONATORUM.

Synonyms.—Asphyxia pallida neurosa, asphyxie des nouveau-nés, apparent death of the newborn. Literally, a pulseless condition of the newborn.

Etiology.—Generally due to mechanical interference with the circulation of the oxygenated blood in the fetus, as may happen from flooding, premature detachment of the placenta, pressure upon the cord resulting in premature stimulation of the respiratory centers from the accumulation of carbon dioxide in the fetal blood, or from the inherent debility of child from any prenatal cause.

Pathological Anatomy.—Dark, liquid blood, engorged internal organs, hemorrhage into serous membranes, intestinal hemorrhage, presence of meconium, mucus, and amniotic fluid or blood in the respiratory tubes. The more frequent locations of hemorrhage are the meningeal surfaces, especially toward the posterior lobes of the cerebrum, around the cerebellum, and in the spinal dura mater.

Symptoms depend upon the amount and duration of the pressure upon the cord; if slight, the child is simply pale and

anemic, the limbs relaxed, and heart-sounds are feeble. If premature respiration has occurred, we may find mechanical asphyxia added, from the inspiration of foreign matters into the mouth, pharynx, and trachea. Frequently divided into *asphyxia livida* and *asphyxia pallida*, which may thus be differentiated:—

In *asphyxia livida* we have cyanosis; injected conjunctivæ; protuberant eyes; strong cardiac action; slow, full pulse; cutaneous sensation; tense musculature; umbilical pulse; intermittent respirations, with generally a favorable prognosis.

In *asphyxia pallida* we find death-like paleness; relaxation; minimum heart-beat; no umbilical pulsation; diaphragmatic respiration poorly established; sphincter paralysis; conjunctival and cutaneous insensibility, also of the palate, which, when it fails to respond to tickling with a finger, is a bad symptom.

Prognosis.—According to Bouchut, if careful auscultation for five minutes fails to reveal any heart-sounds, the case is hopeless; otherwise persevere so long as any action of the heart can be detected, though the duration and degree of the compression endured determines the danger of the asphyxia. It must also be remembered that even when life is preserved, there is subsequent danger from pneumonia or cerebral compression, which may produce permanent paralysis or idiocy later in life.

Prophylaxis, whenever possible, should be attempted, especially in breech presentations and prolapse of the cord, by methods described in the standard text-books on obstetrics.

Therapy.—1. Where there has been premature inspiration, remove all foreign substances from the mouth and trachea, if necessary, by inspiration through a flexible catheter thrust into the wind-pipe.

2. Stimulate respiration by slapping the child's back and buttocks, or by sprinkling alternately with hot and cold water, or immersing in hot and cold baths alternately. The inhalation of brandy, ammonia, or Hoffmann's anodyne. Electrical stimulation, if possible.

3. So long as any motion of the heart can be detected, artificial respiration should be persisted in by means of either Marshall Hall's, Schultz's, or Bird's method, at the rate of not more than sixteen forced respirations a minute.

The writer's preference is for Bird's method, which consists in holding the child on the outspread palms, one under the buttocks, the other behind the head and neck, which are supported between the thumb and second finger. By everting the palms the child's chest is expanded, and by bringing the hands toward each other the air is expelled from the lungs, and the process repeated as often as is necessary to fully expand the lungs.

ATELECTASIS PULMONUM CONGENITUM.

Synonyms.—Fetal lung, congenital atelectasis.

Definition.—A partial persistence of the fetal condition of the lungs after birth.

Etiology.—Any cause which interferes with the initial expansion of the fetal lung. Chief among these may be mentioned asphyxia, accompanied as it frequently is with greater or less paralysis of the respiratory centers. Pressure on the brain may do the same, or premature birth, in consequence of the inspiratory muscles being too feeble to elevate the thorax during inspiration.

Pathological Anatomy.—Unexpanded portions, chiefly at posterior and inferior borders of the lower lobes, and along the free margins of the lungs, which here appear depressed below normal level; reddish brown, bluish, or steel blue. These spots sink readily in water and show a granular surface from which exudes a bloody fluid without air bubbles.

Symptoms and Course.—Such children have a weak, whimpering voice, are often distinctly cyanotic, nurse with difficulty, sleep much, and are prone to die of collapse. Breathing is rapid and superficial; the pupils are dilated and react feebly.

Prognosis is generally unfavorable, death occurring after collapse in the course of a few days. Occasionally convulsions precede death.

Treatment and Prophylaxis.—Whenever atelectasis is feared the child should be encouraged to cry vigorously in order to produce deep inspiration. The respiratory muscles should be stimulated by counterirritation, electricity, change of position, etc. Bodily warmth must be preserved by the use of warm baths, flannels, hot bottles, etc.

CYANOSIS INFANTUM.

Synonyms.—*Morbus ceruleus*, the Blue Disease.

Definition.—Strictly speaking, not a disease at all, but an almost invariable symptom of all diseases attended with defective oxygenation of the blood. Of especial importance in early life as indicating cardiac malformation, though it should be remembered that this may exist without cyanosis. "White cyanosis" is the name given by Moul's to such cases. *Morbus Winckelii* is the name given to an epidemic form of cyanosis first fully described by Winckel in 1879, as observed by him in the Dresden Hospital. Sporadic cases had previously been reported by Garrod, Bigelow, and Baginsky.

Pathology.—Once supposed to be due to malevolent spirits, which are now known to be those of arrested development. (See *Cardiac Malformations*.) In more than half of the cases, examined after death, malformations have been found in the pulmonary artery. Others arise from the mixing of arterial and venous blood in the heart, from a patent foramen ovale or other congenital defects, and others, according to J. Lewis Smith, to a congenital failure of oxygenation of the blood without recognizable lesions. No accurate chemical examination of the blood of cyanotic children has yet been made, but it probably closely resembles ordinary venous blood. The liver is usually enlarged and congested; pericardial and pleuritic effusions are frequent occurrences. More frequent with males than females, and increases in frequency with bulk of population. Often hereditary in families, but, even when due to congenital malformation, symptoms do not necessarily occur immediately after birth.

Symptoms are chiefly those of blueness or lividity of the face, lips, and tips of the fingers, intensified by exertion or fright, which occasion paroxysms of dyspnea. Clubbing of the finger-tips found in all chronic cases.

Prognosis.—Unfavorable for recovery, though not immediately so, for life may be prolonged for years; 80 per cent. die in the first five years. Very bad for Winckel's Disease.

Treatment.—Rest, mental and physical, digitalis, quebracho, and chlorate of potash and tonics.

ICTERUS NEONATORUM.

Definition.—Yellow discoloration of the skin of the newborn, occurring from the third to seventh day.

Etiology.—According to Goodhart may be either physiological or morbid. The first is due to an alteration in blood pressure, caused by the act of birth. This variety is frequent in premature infants and does not stain the conjunctiva and urine yellow while the feces retain their natural color. More or less of this discoloration of the skin is observed in all newborn children; but staining of the sclerotics is due to reabsorption of the coloring matter of the bile, due to either catarrhal or pernicious jaundice.

Ordinary icterus neonatorum arises from mechanical rather than hematogenic causes; because if due to destruction of red corpuscles their number ought to be relatively lessened, but careful counting shows this is not the case. (*Phil. Med. Times*, Vol. XIV, p. 124.)

The reason why infantile jaundice does not invariably occur, is that the amount of interference by the umbilical ligature depends upon the amount of anastomosis of the umbilical vein with veins of abdominal wall, and the relative vigor of cardiac contractions, for the freer these anastomoses the less resorption of bile.

Differentiation.—Catarrhal jaundice is due to a simple catarrh of the ducts. Pernicious jaundice arises from defective circulation in the liver, such as might be caused by congenital hepatitis or malformations. Such causes are hepatitis syphilitica, closure of the ductus choledochus by gall stones, or phlebitis umbilicalis. It is also met with in pyemia from any cause, scarlatina, pneumonia, atelectasis of the lungs on account of a damming up of the blood in the liver from an imperfect emptying of the heart, etc.

Prognosis is generally good, unless mistaken for jaundice due to prenatal disease (icterus embryonum) or syphilitic thickening of the ducts, etc. It should also be carefully distinguished from septic jaundice (see page 22), which is a symptom of the gravest import especially if associated with purulent omphalitis.

Treatment.—Icterus neonatorum is so trivial a physiological accident that it requires no treatment except warmth and rest.

Catarrhal jaundice lasts from one to two weeks, and has a

spontaneous cure, provided serious mistakes in diet are avoided. Pernicious icterus is generally unsuccessfully treated, ending fatally, with rapid atrophy and the appearance of hemorrhagic petechiæ and brain complications, in about two weeks. In umbilical phlebitis antiseptics are to be applied to the navel, and quinin and sulphate of magnesia tried. Death in these cases results from pyemia and gradual wasting; less frequently from umbilical hemorrhage.

SEPTIC INFECTION OF THE NEWBORN.

Etiology.—Septic infection may be either ante- or post-partum, and like other septic poisoning may variously locate itself in the child's body, appearing either as erysipelas, metastatic abscesses, joint disease, pneumonia, endocarditis, or peritonitis. These morbid processes being explained according to modern theories by bacterial invasion, or poisoning from their products, usually through the umbilical wound.

Pathological Anatomy depends upon the part affected. In interuterine sepsis the child's body may show macerated skin, bloody effusion into the cavities of the body, petechiæ in the lungs pericardium and pleura, ecchymoses on the peritoneum, and generally fatty degeneration of the internal organs. Should the child be born alive it may die in a few days from fatty degeneration of the liver or interstitial pneumonia. Very often the septic process begins in the subperitoneal connective tissue surrounding the vessels of the navel, ending in thrombosis and peritonitis. In others, the mucous membrane is the first affected, with ulceration of the mouth, pharynx, or intestinal canal; again it manifests itself in localized gangrene of the skin and subcutaneous tissues, or affections of the joints, or hemorrhage into the brain, liver, or kidneys, or as septic pneumonia, pleuritis, or meningitis.

Symptoms are those of the complications described above. Interuterine sepsis was well known to Underwood, who wrote a hundred years ago: "Infants have not only come into the world with several and inflammatory patches and ichorous blisters about the belly, but with other spots actually in a condition of gangrene." If such children survive they suffer from multiple abscesses and sloughing of the subcutaneous tissue from extensive burrowing of

pus. Suppuration of the joints is by no means infrequent, resulting in separation of the epiphyses and deformity, though not necessarily so. Among other symptoms may appear various diseases of the navel (which see), otitis, erysipelas, dermatitis exfoliata, and septic croup. The general condition of the child is poor. It is emaciated and has high fever; anorexia, diarrhea, prostration and early death from exhaustion, pleurisy, or pneumonia may be confidently expected.

Differential Diagnosis is not difficult, although it is not always easy to settle the source of the septic infection, even after the cutaneous affections, stomatitis, otitis, or joint affections clearly indicate the nature of the disease.

Prognosis.—In general bad, especially so with bottle-fed babies; others may recover even after extensive arthritis. The mortality in epidemics is higher than in sporadic cases.

Treatment.—Chiefly in the way of prophylaxis during pregnancy and parturition, especially during epidemics of puerperal fever, when the child should be removed from the breast. (Baginsky.)

Strict antisepsis should be observed in dressing all septic wounds or those liable to become so. Boracic or salicylic acid, thymol, or iodoform are preferable to carbolic acid for use with children. For treatment of *Erysipelas* see page 25.

ERYSIPELAS NEONATORUM.

Synonyms.—St. Anthony's fire; Rose; Rothlauf.

Definition.—Differs in no wise from that seen in adults, and like that due to a local invasion of the lymphatics and skin by a specific organism.

Occurrence.—Comparatively infrequent since greater care and cleanliness in lying-in asylums, etc. Rarely seen in private American families, unless unfavorably located, as in room over open sewer, noted in a case of the author.

Symptoms.—Those of ordinary erysipelas except a more rapid course than with adults. Attacks umbilicus, genitals, neck, nates, legs, thigh, arm, and face. Migratory often. Peculiar features found only in children under one year.

Etiology.—Still in dispute, but evidently a filth disease, associated with puerperal fever, etc. ; probably due to a micrococcus. More strictly speaking, a specific dermatitis due to a specific organism, the streptococcus erysipelatis. (Fehlman.)

Symptoms and Course.—May proceed to abscess, sloughing, gangrene, and death from pyemia or diarrhea. Or there may be tedious recovery, with cellular induration, or it may be complicated with peritonitis, pleuritis, pericarditis, or meningitis.

Prognosis.—Discouraging, though all do not die. Earlier age more unfavorable, very fatal below three weeks.

Prophylaxis.—Strict cleanliness, antisepsis of the navel, especially in suspected sepsis. Kraske's needle punctures highly recommended by Siebel.

Treatment (Local). Largely consists in exclusion of the air by means of corn starch, cotton wool, white paint, collodion, ichthyol (five per cent.). Hydrogen peroxid, theoretically, best ; tinct. benzoin favorably spoken of, also hot lead-water and opium, or hyposulphite soda (3j to Oj).

(21)

R. Acid. carbolici, gr. xij

Oleic acid, ʒ ij.

To be applied with the finger. (Atkinson.)

Internal. Free use of alcohol and tincture of chlorid of iron, gtt. j-v in glycerin, good food, and strict cleanliness.

Differential Diagnosis.—Sclerema might be mistaken for cellular induration of erysipelas, but former shows skin from first white and cold, with diminished sensibility. Mixed infection of diphtheria and erysipelas sometimes met with. (J. L. Smith.)

TETANUS NEONATORUM.

Synonym.—Trismus neonatorum ; lockjaw ; " nine days' fits."

Etiology.—Infantile tetanus is so largely influenced by locality that it is now generally believed to be due both to a local and to an exciting cause. The latter is some open wound, generally about the navel, and the local cause is a widely distributed bacillus found in garden mold, especially that formed by decaying fish.

Hence the disease is endemic in Iceland, certain portions of Long Island, and frightfully common in the negro huts of the South.

Symptoms.—Premonitory. For one or two days there may be noticed uneasiness, sudden starting during sleep, and fever (4–14 days); next follows, as the first pathognomonic sign, inability to hold the nipple, then difficulty in swallowing, and quickly thereafter rigidity of the lower jaw (trismus) and stiffness of the neck (tetanus). At the same time or somewhat later the facial nerve and the muscles connected with it are implicated, and hence result wrinkling of the skin, closing of the eyes, and pursing of the mouth. Generally this condition quickly extends over the whole body, so that the back and extremities become stiff and wooden, and the abdominal walls hard and tense. The pulse and respiration are frequent and the temperature of the skin is markedly increased (105–111° F.), and this may even increase after death, because the rigidity of the muscles also persists for a while, and every contraction of the same produces a certain degree of heat.

Course.—Is not uniform, occasional hopeful remissions taking place, but as a rule the tonic spasms recur with greater frequency and intensity. Sometimes these paroxysms diminish in frequency just before death, which takes place on the fifth to ninth day of the disease, from exhaustion or asphyxia due to a spasmodic closure of the glottis. Very rarely the temperature falls after a brief elevation, and when it remains so there is hope of recovery.

Autopsies have revealed the umbilical fossa lined with suppurating membrane and vessels still patent. Peritoneum inflamed and cellular tissue saturated with yellowish fluid. Billard reports meningeal apoplexy and thick follicular exudation on spinal arachnoid. Existence of pathognomonic bacillus claimed.

Prognosis.—Bad. The older the child, the lower the temperature, and the longer the duration of the disease, the better the prognosis. The later the onset, the more hopeful the prognosis.

Treatment.—Furlong advises laudanum, others chloroform, for spasms. Best results obtained by stimulation and good nourishment, milk, egg enemata, etc. Hypodermics of woorara, or extract of Calabar bean, are highly recommended. Think favorably of chloral hydrate, which, like chloroform, will relieve spasms,

but will not cure. Merriweather applies blister to umbilicus. Turpentine has a high reputation in the Southern States as a local application. Antitetanus toxin isolated and hopeful results reported.

Prophylaxis.—Pregnant women must not be delivered where disease is endemic, nor child return home until navel is entirely healed under antiseptic dressings, best of which is iodoform. The temperature of the bathing water ought not to be over 34° – 35° C. (100° F.).

SCLEREMA NEONATORUM CONGENITUM.

Definition.—Consists of a hardening of the skin and subcutaneous cellular tissue, accompanied with subnormal temperature.

Etiology.—This constitutional disease—sometimes congenital—attacks premature and atrophic children who are compelled to live in the bad air of overcrowded foundling asylums in large cities. The sinking of the temperature of the body (in consequence of its imperfect calorification) is probably primary, and the stiffening of subcutaneous adipose tissue and the other symptoms are secondary, and due to solidification of animal fats.

Symptoms.—After an indefinite period of premonitory symptoms—somnolence, apathy, difficulty in nursing—acute edema of the skin begins in the most exposed parts, *i. e.*, the face and lower extremities, generally in the calves, when the disease spreads upward or downward. The skin attacked becomes pale, hard, and generally swells considerably from secondary edema (myxœdema), while the skin which remains healthy appears cyanotic. Gradually the whole body becomes affected, and such children lie in bed, cold, stiff, yellow as beeswax, and with countenances so swollen as not to be recognizable. The temperature may fall 18° F. (10° C.), and not even intercurrent pneumonia, which frequently complicates, can bring it to a fever heat (87° —Porteous). Respiration is always laborious and superficial.

Progress.—The disease generally ends fatally within one to four days; very seldom is a cure effected. Recovery begins with respiration becoming freer, nursing easier, and the temperature rising. Then the swelling of the parts affected diminishes reversely as they are affected; but the skin remains cyanotic for a long

while. Intercurrent pneumonia may also interfere with the efforts toward a cure, and death result in two to three weeks.

Autopsies demonstrate an abundant bloody edema of the subcutaneous cellular tissue, which is often changed into gelatinous masses; moreover, serous effusions into the pleura are possible.

Prognosis.—Nearly always fatal.

Treatment.—Supply warmth by means of warm bottles, sand-bags, massage, strong wine, camphor, musk, etc.

Good nourishment, as wet nurse, whose milk must be injected at first, or nourishing enemata.

EDEMA NEONATORUM.

Synonym.—Dropsy of the newborn.

Etiology.—Due to interuterine fetal cardiac or renal disease. Also claimed to arise from maternal disease affecting the placenta.

Pathology and Symptoms are the same as those in the adult. Here mentioned chiefly for sake of differentiation from sclerema neonatorum, previously described.

OPHTHALMIA NEONATORUM.

Synonyms.—Infective conjunctivitis of the newborn. Augentripper der neugeborenen. Infective blenorragia.

Etiology.—Specific infection from the vaginal discharge of the mother at the time of birth, or like infection from carelessness on the part of the nurse. The vernix caseosa serves to guard against this accident, but the premature opening of the infant's eyes may introduce into them irritating matters.

Pathology.—*First Stage* (twelve to twenty-four hours): characterized by a prodromal red line transversely marked on the lids, as if penciled with carmine ink; purulent injection of the conjunctivæ which are slightly edematous and very photophobic. This stage, untreated, passes rapidly into the second stage.

Second Stage: that of general edema of the conjunctivæ and lids, accompanied by a thin, purulent secretion, very profuse and irritating in character. If unchecked the natural course of this is to the destructive

Third Stage : marked by prodigious swelling of the lids, maceration and destruction of the conjunctivæ by the profuse mucopurulent, septic discharge. The cornea is the part most frequently ulcerated, and the process is attended with fever and pain ; or the pathological processes may not reach this final point, but stop anywhere in the above description, reaching a subacute condition, which may persist for months, and result in general hypertrophy of the papillæ of the lids, forming cockscomb-like bands in the vicinity of the canthi, with thickening of the lids.

Course and Symptoms are very variable, for the disease may proceed to gangrene in a few hours, or persist for months as a subacute inflammation. The complications most frequently met with are ectropion, ulceration and abscess of the cornea, conical cornea, hernia of the iris, rupture of the cornea, capsular cataract, staphyloma, leucoma, or total loss of the eye in the worst cases, and even in the more favorable corneal opacities are very frequent.

Differentiation between this and simple catarrhal ophthalmia is made chiefly upon the virulence and rapid course of the first.

Prognosis is good only so long as the cornea remains intact. The earlier the cornea is involved the worse is the prognosis, because the sequelæ of inflammation of the cornea (white cicatrices, etc.) persist for life, and are the most frequent cause of infantile blindness. According to statistics (in 1876) thirty-three per cent. of all the children admitted into the blind asylums of Austria and Germany had become blind from this affection. Nevertheless, the prospects of recovery are generally favorable, if unremitting care is given the child, either by the doctor or a competent nurse.

Treatment.—The most essential part of any efficient method of treating this disease is *frequent* and thorough cleansing of the eye with some weak antiseptic solution, carefully protecting the other eye from infection. Some advise the use of ice bags during the intervals of cleansing, but frequent antiseptic cleansing is more important than the choice of the germicide or antiphlogistic.

Corrosive Sublimate (gr. j- $\frac{3}{4}$ vij). Highly recommended by Smith.

Nitrate of Silver (gr. ss.-v- $\frac{3}{4}$ j). Largely used by some, after previously thoroughly cleansing the eye with a two per cent. solution of boracic acid.

Alum (gr. v-3j) is preferred by others, while zinc sulphate (gr. ij-3j) is always used—Jones.

Zinc chlorid (gr. j-Oj) has given excellent results in the writer's hands when used hourly, or oftener, if necessary.

Solution of yellow pyoktanin (1:100) is very efficient, but frightfully stains the child, its clothing, and the hands of the one using it.

Prophylaxis.—*Credé* has obtained most remarkable results by the use of a two per cent. solution of nitrate of silver, applied to the eyes with a glass rod immediately after birth, by which means this disease has disappeared from the Leipzig hospitals, and nearly so in all the Austrian hospitals. Gaunt advises zinc chlorid. In every suspicious case the vagina and external parts of the mother should be scrupulously cleansed before and during her confinements with a bichlorid (1-5000) or carbolic acid solution.

Moreover, if one eye becomes infected, the other must be protected from contagion by borated cotton laid over it and held in position by adhesive plaster. The utmost care should be taken in handling infected instruments, towels, cotton, etc., for it should be remembered that nurses have more than once lost their eyesight from lack of care. Hence the State of Rhode Island requires that the *monthly nurse* shall report every case of ophthalmia neonatorum within seven days under penalty of \$100 fine, or sixty days' imprisonment, or both.

MASTITIS NEONATORUM.

Synonym.—Hexenmilch.

Definition.—An inflammation of the mammary glands occurring in either sex from an ignorant attempt to empty the breasts by squeezing them.

Etiology.—Compression or bruising of the glands already distended by the milk, for it must be remembered that the mammary glands of boys, as well as girls, often secrete, during the first two weeks, a milky fluid which closely resembles colostrum, except that it is without its sweet taste, and sufficient in one of the author's cases (male Jew) to trickle out by expression.

Progress.—The swelling and redness of the mammary gland

ought to disappear in a few days if let alone; if not, in three or four days fluctuation will be felt until the abscess breaks and the skin heals, some time after. Erysipelas, with deep sloughing of the cellular tissues and generally with a fatal result, occurs only in marasmic infants.

Prognosis.—Generally good; unfavorable only with cachectic children. The worst sequelæ for girls is the destruction of a portion of the mammary gland and cicatrization of the abscess wound, very frequently resulting in a retracted or funnel-shaped nipple.

Treatment.—The best is to absolutely let them alone, but if the mischief has already been done, then resolution of the inflammation must be sought by means of lead wash, iodid of lead ointment, or oil cataplasms. If these fail and the case passes on to suppuration, incise early, with the incision radiating from the nipple to minimize deformity, and treat abscess antiseptically.

HEMORRHAGIA INFANTUM.

Etiology.—Occupies an intermediate position between the physiological and the traumatic accidents of birth, since it may be either. Doubtless the larger proportion of cases are traumatic, but there are others whose origin lies in the faulty development of the fetal blood-vessels. Hemorrhage from this cause is one of the more frequent causes of death within the first forty-eight hours of infant life, especially in syphilitic children. Any of the acute infectious diseases, contracted by the mother during pregnancy, predisposes the child to this hemorrhagic condition, which may manifest itself in the brain, stomach, intestinal canal, vagina, or any of the mucous surfaces of the newborn child. For cerebral hemorrhage, see *Apoplexy*, page 35.

Autopsies made upon newborn infants show almost invariably a congested condition passing to punctate ecchymoses of all the abdominal organs. When this gives rise to actual hemorrhage the condition is called *Melena Neonatorum*, whose symptoms are vomiting and purging of blood, progressive weakness, and death from collapse if the hemorrhage remains unchecked. It may be difficult to distinguish a passage containing coagulated blood from

the meconium passed during the first days of life, unless it be remembered that meconium stains water in which it is placed an olive green, while bloody passages color it bright red. Course, one to five days, and prognosis is not necessarily unfavorable.

Treatment.—Cracked ice, ergot, or the extract hamamelis.

TRAUMATIC ACCIDENTS OF BIRTH.

Congenital Fractures and Dislocations include not only those due to direct violence to the child by means of the hands or the instruments of the obstetrician, but also those due to precipitate birth and dislocations *in utero*, especially those of the hip and shoulder. Cranial fractures are not at all infrequent, as are also those of the clavicle, humerus, and femur. Cranial fractures are either funnel-shaped, grooved, or "spoon bowl." The first form are fissures extending from the periphery of a bone to a point of ossification, and being wider at the periphery than at the center of the bone, are not inappropriately compared to a funnel. The second form is usually found in the parietals, while the spoon bowl, so named from their size and appearance, may be found anywhere on the cranial bones, wherever long-continued pressure of the promontory of the sacrum has produced a permanent depression by the force of the labor pains. Or a similar condition may be produced by forcible use of the forceps in a narrow pelvis. Fractures of the clavicle or humerus are usually produced by forcible extraction in breech-presentations, especially if the arm lies in the neck.

Prognosis.—Simple fissures and the gutter-like depressions of the cranial bones generally have no bad consequences, but the spoon-like depressions generally end fatally in a short time, and even when the life of the child is preserved, brain or nervous diseases remain as sequela, more to be dreaded than death.

The fractures of the bones of the skull, from precipitate birth while the mother is standing, are often without evil results. Fractures of the clavicle and humerus are always without danger (though there may be apparent paralysis of the limb concerned).

Treatment.—In fractures of the skull, treatment for pressure of the brain is indicated. Fractures of the femur or humerus are

to be kept replaced by means of pasteboard splints and light sticking plasters, or silicate dressings. Union without deformity in eight to ten days. Fractures of the clavicle heal spontaneously if arm is kept extended upon a pillow for a few days.

CAPUT SUCCEDANEUM.

Definition.—An edematous swelling of the skin and subcutaneous tissue, caused by uneven pressure upon the presenting parts during labor.

Occurrence.—So common an accident of all tedious labors that it may almost be considered physiological in such cases. Its usual location is over the upper and posterior portion of a parietal, less frequently over the occipital, still less frequently over the frontal, and in breech presentations over the buttocks. These swellings are purely mechanical, being due to an inequality of pressure upon the the presenting parts, hence at the point of least resistance a localized edema is produced.

Pathological Anatomy.—A round, oval, or sometimes elongated swelling, usually one to three inches in its longest diameter, but at times large enough to greatly disfigure the head. Pits but does not fluctuate on pressure; often purplish, and may even become dotted with gangrenous spots, but usually disappears spontaneously in twenty-four to thirty-six hours.

Differentiation may be made by the disappearance of the caput succedaneum in twenty-four to thirty-six hours; other tumors found upon the head are persistent, *e. g.*, cephalhematoma. See next section.

Hernia cerebri, or encephalocele: in line of sutures and pulsates.

Hydromeningocele: grows tense with respiration or crying.

Kephalhematocele: communicates with sutures, and is diminished by cutting off blood therefrom.

Angiomata, or erectile tumors: change color on pressure.

Hydrocephalus: entire shape of head is altered.

Wens, or enlarged sebaceous cysts, are solid, and do not pit.

Hydatid and simple cysts: like all cysts, fluctuate. Hydatids diagnosed by microscope.

Prognosis.—Always favorable. Usually disappear in a few hours, even the largest only persisting for two or three days. In rare cases of breech presentation sloughing has been known to follow. (Parvin.)

Treatment.—The majority of cases need no treatment other than a little vaselin or cold cream. If the skin be broken dust with subnitrate of bismuth or impalpable boracic acid. If the swelling is very great the child may require feeding with a spoon for several days (face presentation), while the reduction of the swelling may be hastened by the application of cloths dipped in alcohol and water, or a solution of muriate of ammonia.

KEPHALHEMATOMA.

Definition.—A hemispherical, elastic, fluctuating tumor of the hairy scalp, *increasing* in size after birth, and thus distinguished from the caput succedaneum.

Etiology.—According to Naegele, often occurs before birth and is due to a hemorrhage into the cellular tissue and periosteum of the cranial bones, especially on the right side. As a rule, however, happens during birth. Occasionally, if a larger vessel has been injured, the effusion does not remain small, but assumes after birth larger dimensions, growing in a few days to a tumefaction which we designate as a true kephalhematoma (c. verum seu subpericranium), situated between the bone and the pericranium. More rarely a true hemorrhage occurs between the aponeurosis of the occipito-frontalis and the pericranium, or laterally under the muscles, especially the temporal. Still more rarely, hemorrhage takes place between the bones and the dura mater on the inner surface of the cranium (c. meningeum s. dura matris) which may produce the symptoms of pressure on the brain. From what has been said it follows that any part of the cranium which has been subjected during labor to great compression, even if of short duration, can be the seat of a kephalhematoma, provided there exists at the same time a predisposition to fragility of the blood-vessels of the periosteum. Consequently it need not be situated, like the caput succedaneum, on the presenting part of the cranium.

The frequency of cephalhematoma is about one case in five hundred or a thousand of confinements.

Course and Symptoms.—After birth the caput succedaneum often hides the deeper-seated cephalhematoma. After the disappearance of the caput succedaneum (occurring, as a rule, in from ten to sixty hours) the cephalhematoma increases and appears as a flat elevation permanent and even enlarging, located most frequently on one of the parietal bones. This tumor increases in size for from four to six days, but, however large it grows, it never overlaps the sutures, because it lies between the bones and the pericranium, which latter is strongly adherent to the edges of the sutures. If, at the same time, there are present the symptoms of pressure on the brain which do not disappear during the first day, there is very probably also cephalhematoma meningeum, or a large and free extravasation of blood into the cavity of the cranium itself. (See *Apoplexy*.)

Prognosis.—Left to itself, true cephalhematoma is not serious, for absorption begins simultaneously with the formation of new bone, which is felt as a bony ring at the rim of the tumor. The tumor becomes more consistent and smaller because the fluid parts of the blood are absorbed, and in the more favorable cases disappears in from one to five months, leaving only a slight elevation of bone, which is covered with movable scalp. More rarely it proceeds to suppuration, with or without the separation of sequestra from the skull, with which purulent meningitis may be associated. Cephalhematoma meningeum generally ends fatally by pressure on the brain, convulsions, etc.

Treatment.—Every source of irritation is to be removed. Lanolin inunctions used daily, or, after the hair has been shaved, a coating of collodion may be applied. Antiseptic incision indicated only when suppuration is feared. Aspiration is preferred by Pinckney French.

APOPLEXIA NEONATORUM.

Synonym.—Asphyxia rubra seu apoplectica.

Pathology.—Hyperemia of the entire head, passing into true

capillary hemorrhage, or larger effusions, even to a rupture of the cerebral sinuses with profuse hemorrhage.

Symptoms and Course.—Child usually well nourished, but born highly cyanosed; the eyeballs often projecting and ecchy-mosed, tongue protruded and swollen, and the head showing a caput succedaneum. The heart's action is weak and irregular. If the effusion is great and located at the base of the brain, the child dies from gradual cessation of the heart's action, with irregular respiration. Or if the effusion is smaller in amount, the child, which at first breathed only at long intervals, may begin more frequent respirations and gradually recover, especially if the effusion has taken place on the convexity of the brain, or if there has been only a high degree of hyperemia without actual rupture.

On the other hand, convulsions, spasm of the facial muscles or of the extremities (see *Spastic Hemiplegia*), are among possible complications or sequelæ.

Prognosis depends upon the amount and location of the effusion, and whether it increases or begins to be absorbed after birth, but the outlook is rarely entirely favorable, even when apparent recovery takes place, for the child is very liable to be left with some defect of speech or mind.

Treatment.—1. If the child is born cyanosed, cut cord at once, and allow one or two teaspoonfuls of blood to escape, or until the face begins to pale.

2. Endeavor to excite reflexly the medulla by stimulation of the skin, or sprinkling the face and breast with cold water.

3. Counteract the morbid condition of the brain as far as possible by artificial respirations, by any method given previously.

Prophylaxis.—See *Obstetric* text-books.

INFANTILE SPASTIC HEMIPLEGIA.

Definition.—Unilateral paralysis with contractions, due to cerebral hemorrhage at time of birth.

Occurrence.—Comparatively infrequent, because usually one of the untoward sequelæ of a breech presentation.

Etiology.—Results from localized atrophy of the cortex, due

to the pressure of a blood clot at that point. Dr. McNutt's post-mortems demonstrate that hemorrhage on the convexity of the brain gives rise to paralysis without convulsions; but that vertex presentations are more liable to produce hemorrhage at base of the brain, causing convulsions, without paralysis, and ordinarily a shorter duration of life.

Pathological Anatomy.—Clot, or its remnants with hematoid crystals, can usually be found in fissure of Rolando, paracentral lobe, or upper part of frontal convolutions. (McNutt.)

Symptoms.—Often initial fever, followed by paralysis with flexion, pronation, etc., with wasting of the affected side. Such children are apt to be passionate and ill-tempered, though sometimes they are dull, aphasic, or stammering in the speech. Sometimes choreic or showing athetoid movements.

Prognosis.—Not necessarily hopeless. Life is often prolonged for years in these spastically paralyzed children.

Treatment.—Passive exercise and massage to prevent wasting of muscles, galvanization, cold douches, with the internal use of potass. iodid and ergot. Deformity apparatus and tenotomy if required.

APOPLEXY OF THE LUNGS.

Occurrence.—One of the rarest accidents at the time of birth, but such cases have been reported by Loomis, Jacobi, and Walsh.

Symptoms.—Nothing abnormal for some hours after birth, then groaning and short spasmodic respiration, with capillary congestion of the extremities, lips dusky, and death from collapse.

Pathological Anatomy.—Effusion of blood into pleural cavity, associated with general pulmonary congestion and interlobular hemorrhage, due probably to fatty degeneration of the vessels.

Differentiation.—Probably not possible during life. Should not be confounded at autopsy with the punctate ecchymoses of the pleura observed in almost all children dying shortly after a difficult labor.

Treatment.—Heat to extremities, hypodermatics of ergotin.

Prognosis.—Most gloomy.

HEMATOCELE TRAUMATICA.

Definition.—Effusion of blood into the tunica vaginalis testis, produced by the long-continued pressure of a tedious labor, usually breech.

Differentiation.—A soft, doughy tumor located in the scrotum, not translucent to light, as is hydrocele, and not reducible, as is hernia. Does not pit on pressure, like edema of the scrotum.

Varieties.—According to König (Kk. p 242) there is a circumscribed hematocele funiculi spermatici, and a diffuse form which forms a tumor for the entire length of the extra-abdominal spermatic cord, and may even pass into the abdominal cavity.

Course.—Differs from ordinary edema of the scrotum, in that only the cutis shrinks, and the testicles remain large and sensitive to touch, and secondary swelling of the skin follows, with fever and deep fluctuation if the formation of pus takes place.

Treatment.—Such effusions are always slowly absorbed, and should be treated mainly expectantly, but may be opened, with antiseptic precautions, and the blood clot evacuated, if absorption cannot be obtained. The tunica should always be incised where there is any evidence of the formation of pus within it, and the cavity treated antiseptically.

PARALYSIS NERVI FACIALIS TRAUMATICA.

Etiology.—As its name implies, is due to the pressure of the forceps on the stylo-mastoid foramen in birth. It is always confined to one side, and usually cures itself in a few days. Wilson says always seen on right side, and may be permanent. For the symptoms of other paralyses of the facial nerve see *Peripheral Diseases of the Nervous System*.

Treatment.—None advised for a week; if persistent, then try faradaic or galvanic currents.

INFLAMMATORY PARALYSIS OF A STERNO-CLEIDOMASTOID.

Symptoms.—Affects only one side, and is sometimes found after breech presentations on the side of the child which was near-

est the mother's sacrum while passing through the pelvis. This side was subjected to a high degree of extension, which was shared by the sterno cleido mastoid, whereby perhaps some of its fibers were torn. After birth the head inclines a little to the affected side, and the muscle is sensitive, perhaps inflamed, and appears thickened and rope-like. The same condition is said to have been noticed after both difficult and normal head presentations. It disappears spontaneously after a few weeks.

Treatment.—Iodin salve; rest.

WOUNDS OF THE FACE AND SCALP

Are not infrequently produced by the blades of the forceps. Such wounds are usually superficial, and heal rapidly under dusting with antiseptic powders (as bismuth and iodoform) or lotions. Punctured wounds have been made by an obstetrician attempting to puncture a caput succedaneum for tough membranes, and the eyelids and eyes themselves have been known to be injured by like brilliant operators. Even ablation of a limb has been reported, and the author knows of a midwife who succeeded in breaking the child's neck and leaving its head behind in utero.

SECTION III.

MALFORMATIONS AND DISEASES OF THE NAVEL, Etc.

EXOMPHALUS.

Synonyms.—Hernia funiculi umbilicalis congenita. Amnion navel.

Pathological Anatomy. Instead of normal cuticle surrounding the umbilicus, we find a thin membrane covering the end of the umbilical cord, and within this loops of the small intestines, and sometimes also the liver, are found. After the sloughing off of the cord, the contents of this hernial sack are exposed.

Etiology.—This condition arises from imperfect development of the abdominal plates, resulting in an unclosed central abdominal slit at the time of the separation of the intestinal and umbilical portions of the amnion. In consequence, the loop of ileum, which at first lies within the umbilical cord, is not withdrawn, but is developed, either alone or in connection with the liver, enclosed within the amniotic covering of the cord. This amniotic sac is often ruptured during or prior to birth, such children being born dead or expiring very shortly after birth. If this is not the case, the coverings soon become gangrenous and fall off, and the exposed loops of intestine early share the same fate and prove rapidly fatal through secondary peritonitis. Very rarely, when the liver is contained within the sac, a spontaneous cure becomes possible by means of the formation of granulations by the peritoneal covering of the liver. Still more rarely does this take place with the intestine, thus closing the abdominal gap by the contraction of the cicatrix and the retraction of the protruding intestine into the abdominal cavity.

Treatment.—1. Good nourishment by breast milk. 2. Local application of carbolated salve or other antiseptic dressings.

Successful cases of operation and recovery by granulation under iodoform dressings are reported in recent literature.

THE CARE OF THE NAVEL.

The normal desiccation of the umbilical cord is a physiological process closely resembling surgical torsion of the arteries, for if the child dies at birth, clots do not form within the umbilical vessels, which remain patulous and may be injected. Ordinarily these clots form a line of demarcation about the fifth day from which the horny-like cord should drop away without assistance and leave a moist, puckered cicatrix behind. The size and condition of this scar depends largely upon the amount of the Whartonian jelly in the cord, and the care that has been given it for the first few days after birth. The exact length that it should be cut is of small importance compared with its being securely tied with aseptic silk, and, preferably, doubled upon itself if it is large and gelatinous, and held in place with a rubber band slipped over

the doubled cord. The stump should then be freely dusted with impalpable boracic acid and wrapped in aseptic cotton as one would a cut finger. This dressing should be removed sufficiently often to keep the desiccating cord in an aseptic condition, and leave the umbilicus without inflammation at the time of the spontaneous separation of the cord. This should never be artificially hastened, even if the separation should be delayed as late as the ninth to tenth day, as sometimes happens with large and gelatinous cords. Some of the older writers speak of what they call "persistence of vitality in the cord" remaining for months after birth. These cases, in all probability, were unrecognized cases of persistence of the vitelline duct, or

Congenital umbilical polypi, which not unfrequently are found after the separation of the cord implanted on the umbilical cicatrix, as a smooth, deep-reddish polypoid growth, one or more centimeters in length, and usually pedunculated. They closely resemble in appearance rectal polypi and secrete upon their surface a viscid fluid, acid in reaction, and, according to Tillmann, containing pepsin. They persist for years without any appreciable effect upon the general health, and often are difficult to differentiate from umbilical granulations or angioma, except by a microscopic examination after removal, which should be done as early as practicable.

INFLAMMATION OF THE NAVEL.

Synonyms.—Omphalitis, ulceration of the navel.

Etiology, etc.—When from uncleanness, or septic infection, the normal cicatrization of the navel is interfered with, there results excoriation and ulceration of the umbilical folds, often attended with inflammation and great pain. Not infrequently granulations spring from these umbilical ulcerations, constituting the so-called fungus umbilicalis.

Course.—The omphalitis may assume a diphtheritic or gangrenous form, with all the dangers connected therewith, or the ulceration may proceed to actual perforation of the abdominal cavity with death from septic peritonitis. Or, as more frequently

happens, if the strength of the child is preserved, tedious recovery takes place by means of cicatrization.

Prophylaxis is more important than subsequent treatment, and is best accomplished by mummification of the cord by means of impalpable boracic acid or lycopodium on cotton. Later, careful examination of the navel after the separation of the cord and the cauterization, if necessary, of any unhealthy ulcerating spots as they appear, with nitrate of silver, should never be forgotten. Should the stump assume a diphtheritic or gangrenous appearance, the promptest possible recourse should be had to local antiseptic and general constitutional treatment, as elsewhere directed for these diseases.

Treatment.—With the first appearance of inflammation about the navel, the surrounding parts should be scrupulously cleaned with some mild antiseptic and the umbilical cicatrix packed with aristol, or bismuth and iodoform. Granulations should be snipped off with sharp scissors or brushed with a solution of nitrate of silver (gr. x-f $\frac{3}{4}$ j). The surrounding cellulitis should be held in check by compressors soaked in a saturated solution of boracic acid or a weak leadwash. Diphtheritic cases require the generous use of coffee, wine, and quinin inunctions with the local use of peroxid of hydrogen.

GANGRENE OF THE NAVEL.

Definition.—Omphalitis terminating in gangrene, which manifests itself as a sloughing gray mass with a carrion-like odor.

Etiology.—Always preceded by ulceration or phlebitis, and especially frequent in the atrophic children of infected lying-in establishments.

Course.—Occasionally a line of demarcation forms, and the enclosed part sloughs away, leaving healthy granulations below, when the ulcer may heal by cicatrization. Generally death occurs in seven to fourteen days, accompanied with pernicious icterus.

Complications.—If the urachus is patulous, instead of having been converted into the middle vesical ligament, gangrene may attack it and a urinary fistula result. Or peritonitis may supervene, with or without suppuration, and in the former case it is possible

to have the establishment of a fecal fistula, through which feces may pass later via the umbilicus.

Treatment.—Prompt removal from the infected spot; wine, coffee, and wet-nurse, if possible. Strictest cleanliness by means of washing, and the local use of disinfectants, as a solution of carbolic acid or permanganate of potassa (3ss-Oj), hydrogen peroxid spray, or iodoform powder dusted in the sloughing tissues.

PHLEBITIS ET ARTERITIS UMBILICALIS.

Definition.—Inflammation of the arteries and vein of the umbilical stump, generally conjoined with omphalitis.

Etiology.—Originates from suppuration of the coagula which fill up that portion of the umbilical vessels within the abdominal parietes. Arteries often alone affected.

Symptoms.—Often escapes the attention even of a trained physician, but may be *suspected when there is prolonged umbilical suppuration*, and when pressure over the track of the umbilical vessels crowd out a drop or two of pus. Generally there is also high fever and great restlessness, except of the abdominal muscles, which are moved as little as possible. Sometimes also jaundice.

Complications.—Reabsorption of pus may be productive of pyemia and peritonitis, or pleurisy and abscess of the liver occur, or death may occur from erysipelas.

Prognosis.—Death usually before the end of the third week, unless the pus lessens and repair by coagulation begins under proper treatment, but even then these cases are very prone to relapse, some of them persisting to puberty.

Treatment.—Great cleanliness and copious syringing with carbolized water, to be followed by the application of hydrogen peroxid. Good nourishment, and wet-nurse if necessary.

HERNIA UMBILICALIS ACQUISITA.

Definition.—As the name implies, it is an acquired protrusion of the omentum, etc., through the navel ring.

Etiology.—Occurs quite frequently, being due to either an incomplete closure of the navel ring, from failure to cicatrize, or

complete closure which has been dilated by great meteorismus, impacted feces, continuous crying of atrophic children, or any other cause which produces sufficient abdominal pressure to crowd a loop of the small intestine and omentum against the umbilical ring until it dilates.

Symptoms.—The true navel, expanding less than the integument, is generally found crowded over to one side of the abdominal tumor, which may be of the size of a cherry pit to a pigeon's egg. This may be reduced with a gurgling sound, while at the same time the edges of the hernial opening may be felt beneath the fingers.

Prognosis.—Usually recovery with increase of the adipose tissue of the child. Occasionally it persists until adult life, and still more rarely in these cases does it result in incarceration of the intestine. Chiefly of importance as a possible complication in later pregnancy.

Treatment.—Reduce hernia, and apply over it a piece of flat cork, a little larger than the navel, kept in place by a strip of adhesive plaster, with binder over all. Kormann advises the use of a long strip of adhesive plaster, passed around the back of the child, its ends crossing over the skin laid in a fold over the navel. To avoid the unpleasant abrasion of the skin from the irritation of the plaster, the child ought to be bathed, and the adhesive plaster renewed daily, for from three to six months.

SECTION IV.

CARE OF THE NEWBORN AND DISEASES ARISING FROM MALNUTRITION OF THE INFANT.

Clothing.—The ideal dress for a newborn child is a loosely knit woolen band, socks, diaper, containing oakum to receive the first meconial discharges, and a loose, short, flannel wrapper; only these and nothing more in the way of pinning blankets,

bands, skirts, shirts, et al. so dear to the heart of the young mother. The days of swaddling and salting the navel (Ezekiel xvi: 4) have passed for all except Italians and Russians, but the American child is still in bondage to its grandmother in the matter of its dress during infancy. Recognizing fully, as I do, the slight influence of the physician upon fashions, good or bad, the writer, nevertheless, sincerely entreats the reader, so far as in him lies, to protect the newborn in its inalienable rights to comfortable clothing, pure air, and suitable food. Comfortable clothing for the infant implies that it shall be kept warm, and it should be remembered that radiation is more rapid in the newborn than later in life, and hence it should be washed and changed in a temperature that may be uncomfortable to the adult. Premature children require a *couvreuse*, or when this is impossible it is far better to wrap the child in cotton wool and substitute oiling for the bath usually given immediately after birth.

Bathing.—The first bath should be given in the nurse's lap, using preferably a bit of soft flannel instead of a sponge to remove the smegma, the name given to the cheesy-like substance found on the skin of the newborn child. The over-zealous efforts of an ignorant monthly nurse to scrub away all of this smegma irritates the tender skin of the babe, to which not even castile soap, but the white of an egg, purified vaselin, or unsalted lard may be used for the first cleansing, which should never be too vigorous. It does no possible harm to leave bits of this smegma until it rolls up and comes away of its own accord, and in some of the best lying-in hospitals the newborn child is not washed at all, except the eyes, for the first twenty-four hours, but simply wrapped in soft flannel and allowed to sleep. In one of the modern German hospitals the infant, if at all puny, is packed in warm, sterilized bran up to its neck, reminding one of the customs of the Cheyenne Indians, who use for this purpose dried horse manure, or the South Africans, who plant their babies in dry sand. The Italians, like the North American Indians, bandage their babies on a board, with appropriate arrangements for drainage, and consider that a bath during childhood is almost murder, and after that little short of suicide. Well-to-do American infants usually are given two warm (95–100° F.) baths daily for the first year, and after that

once a day for the second year. If the child is vigorous the temperature of the bath may be safely reduced to 86° , if care be taken that chilling does not follow. Very weak children should be sponged instead of given an entire bath, which should never be persisted in if the child leaves it blue, cold, or frightened.

Sleep.—The newborn infant should sleep about twenty-two hours out of a possible twenty-four; gradually diminishing this until at two years the child ought to sleep at least twelve hours of the day, and at three not less than eleven. Sleep is largely a matter of habit with young children and they cannot be too early inducted into correct habits in this matter, for the American child is too often left to its own sweet will in the matter. The ideal infant, though there are very few of them left, should sleep consecutively from 11 P. M. to 5 A. M. whether nursing or not. It should also have a morning nap from 12 to 2 P. M., for which purpose the child should be undressed and put to bed with unchanging regularity, if possible in a room set apart for that purpose, with temperature 64° to 70° .

Ventilation.—Bad air is perhaps the most frequent injustice inflicted upon the well-born American infant. Steam-heated apartments, slovenly help, and the exigencies of the modern dwelling have much to do with our enormous infant mortality in all large cities. No child, nor adult either, for that matter, can remain well and breathe the vitiated air of a single room. Such poisoned air makes the mother nervous, neurasthenic, and nagging, and works even more injury upon a tender infant. From 240 to 300 cubic feet of space should be the minimum permissible for each person in a living or sleeping room, and some arrangement should be made by which at least 600 cubic feet of vitiated air per person shall be drawn from such rooms every hour. This can be most easily accomplished by an open fireplace, which whenever possible should determine the choice of the nursery; heating, of course, usually being done by other methods than the open grate, which should be insisted upon solely for the purpose of ventilation, easily accomplished by placing a lighted candle or lamp in the grate to establish ventilation through the chimney upward whenever necessary. Failing this, a narrow board or slat four inches wide and cut the exact width of the lower sash may be placed beneath it, and will in this way leave an opening between the upper

and lower sashes through which can be secured good ventilation without direct drafts upon the occupants of the room. The usual antipathy against night air is thoroughly unreasonable, as it is by far the best that we have in our large cities. Babies may be carried out-doors as early as six weeks if the weather is favorable; but at this tender age should be carried in the arms of the nurse and not jolted in a baby carriage, where too often the child is allowed to grow wet and cold by a careless nurse girl.

Anuria, or retention of the urine, in the newborn not unfrequently unduly alarms the mother or nurse. Frequently urine is voided during birth, and the fact escapes the attention of the nurse, and on the other hand there may be suppression for twelve, twenty-four, or even forty-eight hours without any subsequent injury to the child. In these latter cases, where no malformation can be detected, the existence of uric acid infarcts in the kidneys may be suspected (see page 11). Even these rarely give rise to calculi, though it is possible that they may, unless they are early dissolved away by the free use of warm sugar water, which is the only thing that should be used, except an occasional hip bath, in the place of the gin, sweet spirits of niter, marshmallow, or parsley tea so often administered to these unfortunate infants. All such drugging invariably gives rise to indigestion and

Flatulency, one of the young child's most frequent ailments. The evacuation of wind, or the passage upward of sour-smelling eructations, generally affords temporary relief. Such children are very irritable, from the pains being repeated at every meal, and especially annoying at night, when the child is apt to be feverish and seized with fits of screaming. At such times the feet are cold, though the bowels, hands, and cheeks are hot. The appetite, generally, is ravenous, the child eating everything that is offered it, but nevertheless continues to waste and suffer from various intercurrent ailments, such as nettle-rash, strophulus—red and white gum—thrush, "inward fits," diarrhea, aphthæ, bronchitis, etc.

Treatment of Infantile Flatulency and Colic consists, first, in the immediate relief of its agonizing pain, and, secondly, in the removal of its cause, which usually must be sought for

either in indigestion or malaria. For immediate relief, any of the following will be found useful:—

(22)

R. Spt. junip. compound, 10 c.c.
 Glycerinæ, 5 c.c.
 Aquæ anisi, 45 c.c. M.
 SIG.—Teaspoonful in hot water, as required.—(H.)

(23)

R. Sodii bicarb., gr. xvj
 Syrupi simplicis, $\frac{3}{4}$ ss
 Aquæ menth. pip., $\frac{3}{4}$ iss. M.
 SIG.—Teaspoonful p. r. n. for a child a month old.—(STARR.)

(24)

R. Pot. bromidi, gr. xvj
 Chloral hydrat., gr. viij
 Syrupi aur. cort., $\frac{3}{4}$ ss
 Aquæ menth. pip., $\frac{3}{4}$ iss. M.
 SIG.— $\frac{3}{4}$ j pro dosi at one-half hour intervals.

(25)

R. Liq. am. anisat., 4 c.c.
 Spt. chloroformi, 1 c.c.
 Elixir lactopeptin., 55 c.c. M.
 SIG.—One-half teaspoonful to a teaspoonful every fifteen minutes.

In obstinate cases hot fomentations or enemata will be found useful, and if relief can be found in no other way, resort to opiates is justifiable, of which the pulv. cretæ aromat. cum opii ($\frac{1}{40}$ part opium) can be used *carefully*, with satisfactory results.

Constipation is one of the minor and more frequent ailments even of very young infants. It arises both from errors in feeding and from the relatively pouch-like condition of the colon in children under two years of age. This is often aggravated by a mild degree of gastric or intestinal catarrh, which coats the feces with mucus and thus interferes with peristalsis. Constipation is never

to be neglected in the hope that nature will bring matters around all right after a time, but, on the contrary, every effort should be made to encourage, and, if necessary, mechanically assist a daily motion from the bowels *until the child is two years of age*, after which time the anatomical cause of the child's constipation rectifies itself.

Treatment.—In very young children nothing is better than a daily warm oil, or soapy water enema, or a small glycerin suppository. Milk of magnesia may be added to the nursing bottle, p. r. n., and for older children Starr recommends:—

(26)

| | | | |
|----|----------------------------|---------------|-----------|
| ℞. | Res. podophyll., | gr. ss | |
| | Alcohol, | q. s. ad sol. | |
| | Syrupi, | ad . . . | ℥ iij. M. |

Sig.—℥ j once or twice daily.

which can be recommended as efficient, but is often obstinately refused even on sugar by Chicago children.

In such cases cascara cordial or syrup of figs may be substituted with good results, remembering that if persevered in eventually a proper habit is established. In fact, the child soon becomes a bundle of habits, good or bad, even in as trivial a matter as the time of day in which the bowel movement occurs.

Aphorism VI.—Under no circumstances, except by the positive order of a physician, should a young child be allowed to remain constipated over thirty-six hours.

Atrophia infantum is simply another name for gradual starvation produced from any cause whatever. It is also known as marasmus, asthenia, atrepsia, general wasting, etc. It has already been noted that there is a physiological loss of weight immediately after birth (see page 15) which should cease within three days. Persistence of this loss of weight after that period constitutes atrophia infantum, which may vary from simple failure to increase in weight to the most painful emaciation. Any degree of wasting ought to be a source of anxiety both to the parents and physician, since starvation is the most frequent cause of death in young children. Hirst says most truly: "Comparatively few children die

from diseases interfering directly with the functions of the heart or lungs sufficiently to produce death, while multitudes die from failure to maintain the nutrition of the body sufficiently for the vital processes." Such children die from slow starvation, or marasmus, as we more tenderly name it. This occurs whenever food for any considerable length of time is insufficiently assimilated to repair tissue waste. This may be learned with absolute accuracy by daily weighing, and may always be suspected whenever we find emaciation, febrile exacerbations, depressed temperature, wakefulness, delirium, and other nervous symptoms not otherwise to be explained. These nervous evidences of malnutrition have recently been carefully studied by Rachford. Among these psychoneuroses he places, in addition to those already mentioned, chorea, pavor nocturnus, and the hyperesthesia of scurvy. Christopher goes even further, claiming that general convulsions, except as the result of direct brain disease, are proof of impaired nutrition in the child. (See *Rickets* and *Eclampsia*.)

Simple atrophy arises from an insufficiency of food otherwise good. In such cases the infant gradually loses its plumpness, the fat slowly disappearing and the muscles growing very flaccid and soft. The face is pale and the lips thin. The child does not thrive and is peevish. It takes the breast ravenously, and not infrequently, if the milk is scanty, the child suddenly stops and cries passionately, as if from vexation. Its skin is moist, and perspires readily and copiously, as does the rickety child. The fontanel is level or depressed. If the child is generally sleepless and irritable at night, but sleeps at the breast, it is a sure sign that the milk is thin and serous, and lacks satisfying qualities.

During the day the child is very quiet and drowsy, or holds the thumbs in the mouth and sucks them until the skin about the nails becomes raw and abraded. The bowels are usually constipated, and the motions solid and well colored.

More frequently atrophy is preceded or attended with attacks of *acute indigestion*, attended with pain, vomiting, and a sudden high rise of temperature. Such attacks closely simulate the onset of scarlet fever or other of the zymotic diseases, but a brisk purgative clears up rapidly the otherwise doubtful diagnosis. These attacks leave behind them more or less gastroduodenal catarrh,

whose symptoms, therefore, are added to those already detailed. Such children, after the acute pain has passed, are dull and drowsy, and show depression of the fontanel. Not infrequently there is slight jaundicing of the skin, and the bowels irregular, constipation alternating with diarrhea. The stools are ordinarily hard, whitish, and lumpy, consisting largely of undigested milk curds, coated with stringy mucus; or there may be three or four loose, slimy, greenish passages a day instead.

Treatment often taxes to the utmost the skill of the physician, whose success depends not upon the amount and times at which food is administered, but upon the amount of the food that the marasmic infant can assimilate. Trouble often begins with the stupidity of the monthly nurse, who, in the language of Meigs, directly "flies into the face of Providence by filling the newborn infant's stomach with saccharine mixtures, gruel, or the milk of quadrupeds." But this error seems to be world-wide, for all sorts of substances are used to appease the newborn child until the coming of its mother's milk. The Chinese fill the child with an infusion of umbilical cord; the Kalmucks give it raw mutton to suck for the first few days; in Southern India it is fed upon boiled honey until the third day; in the Transvaal upon soft mush; in America, cracker-water and castor oil seem to be the favorites of the monthly nurse. All these are unnecessary and hurtful, as Nature has provided for the interval before the coming of the milk by the mother's colostrum, and if this is drawn early from the breasts, to which the child should be applied so soon as the mother has sufficiently rallied to allow it, nursing aids in uterine contraction, and the few drops of colostrum thus obtained act as a gentle laxative. Colostrum differs physically from ordinary breast milk mainly in color, which is pale yellow, due to the presence, in addition to the ordinary milk globules, of other granular, pale yellow corpuscles, to which this milk undoubtedly owes its laxative properties.

As young mothers often find it difficult to nurse their first babe, they should be shown that this can be most easily done by laying the child on the mother's arm, and having her bend her body slightly forward until the nipple falls easily into the child's mouth.

At first she should steady the nipple between two fingers, thus holding it in its proper place and regulating in a measure the flow of milk. Normal nursing ought to occupy about fifteen minutes, and the child should be alternately nursed from each breast, which ought to contain enough to satisfy the child at that nursing, during which, if sufficient, the babe usually drops asleep with the nipple in its mouth. During the first six months the infant may be nursed every one-and-a-half to two hours if awake; after that, for the next few weeks, it ought to be nursed regularly every two hours, from 5 A. M. to 11 P. M., when it may be laid in its own bed or cradle, and *ought* to sleep until 5 A. M. If it will not, it may be given a little warm, sweetened water from a bottle and nothing else until morning, for here, as everywhere else, the young child soon falls into an established habit. At four months the infant needs to be nursed only six times in the day, or every three hours, provided it is satisfied at each nursing; and, after six months, usually five nursings a day are sufficient. Such is the ideal course to be adopted with the normal babe and perfect mother, but, as a matter of fact, too often we are obliged to resort to—

Mixed feeding whenever the mother's breasts are not able to furnish the child more than one or two nursings a day. In such cases we must separate the nursings as far as possible and give any of the following substitutes in the interval every 2–4 hours, but do not starve the child on cracker water, oatmeal gruel, or too greatly diluted *condensed milk*. And it should be remembered that condensed milk is only to be used as a temporary succedaneum, in which way it often serves us a good turn for a few weeks or days. Condensed milk requires four parts of water to bring it back to ordinary milk, hence it may be prepared for the youngest infants by adding one teaspoonful of the milk to four of lime water and ten of hot, sterilized water. For older children it may be prepared with equal parts of barley water alkalized, but owing to the large amount of sugar which is added to condensed milk to preserve it, its use should be only temporary. Hence where it is absolutely necessary to supplement or substitute something for mother's milk, any of the following can be recommended for continued use as better than condensed milk:—

Substitute No. I.

2 tablespoonfuls of lime-water.

2 " cream.

1 " good milk.

3 " milk-sugar water prepared by dissolving $17\frac{3}{4}$
— drams of milk-sugar in a pint of hot water. This

8 " mixture should be kept well corked in a cool place,
and renewed as often as it grows turbid.

(C. V. Meigs.)

The eight tablespoonfuls are amply sufficient for one feeding, which should be given blood warm, every two hours, if infant is awake.

II.

1 tablespoonful cream.

2 " of whey.

2 " hot water.

The whey, of course, to be strained and the mixture given from a bottle, or one-third lime-water may be substituted for the whey, from six weeks to three months.

III.

Keating's Barley Blanc Mange.— \mathfrak{z} ij— \mathfrak{z} iv Robinson's prepared barley flour to Oj boiling milk; stir for twenty minutes at a boil, sweeten, allow to cool and solidify. \mathfrak{z} iv of this is heated and given in a bottle.

IV.

M. P. Jacobi's.—2 tablespoonfuls pearl barley to Ojss water; boil off one-third and dilute aa with good milk, using upper third of milk. N. B. If made fresh each time, use \mathfrak{z} j barley to \mathfrak{z} iv water.

V.

J. F. Meigs'.— \mathfrak{D} j Russian isinglass or 2 square inches of ordinary gelatin in $\frac{1}{2}$ pint cold water by boiling, then add to this \mathfrak{z} j arrowroot rubbed to paste with $\frac{1}{3}$ — $\frac{2}{3}$ as much of good milk (p. r. n.); boil and add 2 tablespoonfuls of cream to the Oj. (Meigs and Pepper.)
Or, equal parts of thin arrowroot, water, lime-water, milk, and cream.

VI.

J. L. Smith's Peptonized Milk.—

1 gill ($\frac{5}{8}$ iss) unskimmed milk.

1 “ “ water.

2 tablespoonfuls cream.

200 grains milk-sugar.

1 $\frac{1}{4}$ grains ext. pancreatin. (Fairchild's.)

4 grains bicarbonate soda; put all in bottle, in water as hot as your hands can bear for twenty minutes, warm, and feed.

Oliver leaves out soda and keeps on milk till warmed (6 minutes).

In regard to the multitude of patent and proprietary infant foods upon the market, it need only be said that they are all for sale for the benefit of their manufacturers, and the intelligent physician who is willing to study his cases ought to be able to combine a more appropriate food for each case than that made for the wholesale trade.

N. B.—Rigid cleanliness in all articles used in the preparation of artificial foods must be absolutely insisted upon, and only simple black nipples, such as can be turned and scrubbed daily, used. At least two of these and two bottles should be used daily, being kept alternately in weak saleratus water. After each feeding the child's mouth should be washed out with a bit of soft rag dipped in fresh water containing a pinch of borax, for in this way the occurrence of thrush may be prevented. In every case of bottle indigestion, the physician ought to inspect and smell the bottle, to convince himself as to its sourness, or otherwise.

Finally, it must be remembered that the crucial test of an artificial food is not that it shall be scientifically combined, but that it shall be readily digested and nourish the child. If this be not so, then it will surely suffer from

Acute Indigestion, which may produce the most alarming symptoms met with in early infancy, closely resembling the onset of the zymotic diseases, due probably to autogenetic poisons from improper foods, especially if at the same time the child has been exposed to cold. During such an attack, the skin becomes hot, the face flushed, and there is violent retching and vomiting of sour-smelling food and mucus mixed with more or less bile—yellow or

green. The bowels are loose, often extremely so; motions dark-green or putty-like, passed with much straining and griping, sometimes so extreme that the child screams, pulls up the legs, and rolls from side to side. The tongue is coated, the belly full and hard, and the child refuses food, but drinks greedily, and vomits soon after swallowing. Convulsions may also occur, sometimes frequent and fatal, but usually the vomiting ceases after the first day, or becomes very infrequent; but the diarrhea is apt to persist, with watery, loose, and usually offensive stools.

Course, if neglected, is toward a frequent repetition of these attacks of acute indigestion, each one leaving the child a little more debilitated, until at last it passes into a condition of marasmus (see *Simple Atrophy*, page 50), finally dying either from exhaustion or from some intercurrent disease which it has become too feeble to resist.

Treatment.—Success in treatment depends so largely on a correct knowledge of the etiology, in both acute indigestion and resulting atrophy, that we can hardly do more than treat its exciting causes. If these are remediable, then we may hope for success; otherwise not. We may peptonize, sterilize, Pasteurize ever so skillfully and yet fail wofully. The child is unable to assimilate these physico-chemical compounds, as is too often the case. Failing in these, the physician naturally turns to the *wet-nurse*, but even she is not an infallible panacea for these cases. Often it is impossible to obtain one at all, and when found it is by no means certain that her milk will agree with her foster child. This is particularly apt to happen when her breast is older than the ailing babe. In such cases breast milk is apt to disagree from its richness, for human milk grows richer in cream and curd with lactation. Or, as more frequently happens, the digestive organs of the starving child have become so seriously impaired that the babe is unable to assimilate any kind or age of milk. In the choice of a wet nurse it should be remembered that, as a rule, slight, fair-complexioned women furnish the best breast milk. The lactometer invented by Dr. L. Emmet Holt will be found a most convenient instrument for testing the cream value of breast milk, but the best criterion of its value may be found in the pleasure that the child experiences in nursing and its subsequent increase in weight.

Prognosis and Prophylaxis.—With Dr. Starr the writer believes that these marasmic patients need never be despaired of until chronic diarrhea or spurious hydrocephalus supervene, but it is far better to prevent the causes of marasmus than to attempt to combat their doleful results later. The slightest indigestion in a bottle-fed baby should be remedied at once. Flannel bands, sterilized foods, and the abolition of the uncleanly, long nursing tubes would save many a life that is now sacrificed to laziness. Furthermore, take the newborn child's temperature at least twice a day for the first three or four days after birth. Any sudden rise of temperature ($102-106^{\circ}$), not otherwise explained, betokens a dangerous, rapid wasting, and calls urgently for the free use of water or artificial feeding until the arrival of the mother's milk.

2. MUCOUS DISEASE.

Definition.—A name given by Eustace Smith to a group of symptoms, attended with impaired nutrition, due to an excess of mucus in the entire alimentary canal.

Occurrence.—As a "symptom-complex" frequently met with, but doubtful, except for convenience, whether it should be considered as a distinct disease, for it is not associated with anatomical lesions other than those of chronic indigestion, and possibly those of incipient rachitis, or tuberculosis.

Symptoms.—A soft, flabby tongue, indented and smeared with mucus, is particularly characteristic of this disease. (Starr.) We find the child languid and pale, sallow, easily tired, and sleeping poorly at nights. It loses flesh, and there are frequently dark sepia circles underneath the eyes, and sudden changes of color in the face, now flushed, and now deadly white, as if faint. A curious irritability is also characteristic, the child being fretful, capricious, and crying needlessly, languid by day and disturbed in sleep by night terrors. The appetite is capricious, and the abdomen large and protruding; the limbs small and wasted. The child is usually constipated, and the stools scanty and consist of small, dry lumps, containing a large quantity of free mucus, and their passage is generally attended with straining, and sometimes with prolapsus ani; or constipation and diarrhea may alternate, there being a week or so of constipation, and

then a dozen or more loose passages, constituting the so-called "bilious attacks."

The breath is often extremely offensive, especially in the morning, the tonsils being coated with a thick, foul-smelling secretion, although fetor of the breath may be present with perfectly clean tonsils, the odor in such cases being due to the perverted secretions of the post-pharyngeal glands. Again, there may be headaches, with jaundice and wandering abdominal or thoracic pains.

The skin early becomes impaired in its functions and is often rough and harsh, especially on the chest and arms, which are at times covered with branny epithelium. The lymphatics are prone to enlarge upon slight provocation, but do not necessarily suppurate or remain swollen. The temperature is slightly, if at all affected. Urine generally loaded with urates and high colored.

Course and Prognosis.—This condition of affairs is by no means constant, there being intervals between the bilious attacks of apparent convalescence, but they are not of long continuance. The bad symptoms again return, and at last culminate in another crisis, from which the child emerges thinner and weaker. A hacking cough and intestinal worms not infrequently complicate this stage of the disease, which may persist until fatal exhaustion.

Etiology.—Excess of gastric and intestinal mucus ferments and decomposes the food with which it comes into contact, thereby rendering it indigestible and slow of absorption, while the resulting acid coagulates the mucus and interferes with peristalsis. The stools of infants always contain more mucus than those of adults, and many causes tend to increase this mucus to an abnormal amount. Among such may be mentioned scarlatina, measles, and whooping-cough, which latter Eustace Smith believes the most frequent cause of mucous disease, as excess of mucus is swallowed in pertussis, and intestinal derangement is one of its constant complications; hence its great mortality in young children. The beginning of second dentition is also a favorite time for the appearance of mucous disease, for similar causes.

Differentiation.—Not easy, especially from incipient tuberculosis, to which it apparently predisposes. The absence of afternoon temperature and presence of drowsiness after eating,

night terrors, and "worm-eaten" tongue are all helpful in the way of diagnosis of mucous disease.

Treatment.—The cause being well known, treatment must be directed to the removal of the excess of mucus from the alimentary canal. Either of the following is useful for keeping the bowels cleared of mucus and poorly digested food:—

(27)

| | | | |
|--|--|------|----|
| R. | Sod. bicarb., | ℥j | |
| | Fld. ext. sennæ, | ℥ij | |
| | Inf. gent. comp., ad | ℥ij. | M. |
| SIG.—Teaspoonful before eating.—Starr. | | | |

(28)

| | | | |
|------------------------------|-----------------------------|---------|----|
| R. | Sod. bicarb., | 2 gm. | |
| | Sod. phosphat., | 8 gm. | |
| | Syr. rhei. arom., | 15 c.c. | |
| | Cascara cordial, | 45 c.c. | M. |
| SIG.—℥j-ij mane et nocte.—H. | | | |

But regulation of diet is more necessary than medication. Exclude as far as possible all starchy foods, cake and candy, tea and coffee, but allow fish, milk, eggs, and lean meat, celery, asparagus, raw oysters, and lettuce, making from time to time a diet list like the annexed. Also see to it that the child is kept in flannels, for "children dressed for beauty, with four or five inches of bare leg, nine times out of ten suffer from chronic indigestion or bronchitis." (Starr.) Every morning the child should be given a sponge bath (60°) in a properly warmed room, then rubbed with a crash towel and anointed with vaselin, cold cream, or oil of sesame. Out-door exercise on pleasant winter days, and as largely as possible in summer, greatly hastens recovery, which is almost certain with patience and persistence on the part of the physician.

DIET TABLE.

Breakfast.—Lime-water and milk, soft egg, stale bread.

Lunch.—Beef tea and cracker.

Dinner.—Chop or lean beef, *no potatoes* nor more than one vegetable, custard or nogg.

Supper.—Milk and crackers, or oysters, raw or stewed.

3. RACHITIS.

Synonyms.—Rickets; innutrio ossium.

Definition.—Innutrio ossium is a constitutional defect by which the bones are illy nourished, and become malformed in consequence. Name derived from *rachis*, the spine, from its frequent deformity.

Varieties.—(a) that in which no lime salts are deposited; (b) that in which those already deposited are carried away (osteomalacia).

History and Occurrence.—First described by Glisson in the seventeenth century. May, but rarely does, occur in inter-uterine life (congenital rickets). Most frequent from the middle of the first year to the end of the second year in life. About equally divided between boys and girls. The most frequent of the diseases of children in the larger cities of Europe; among Italians and negroes in this country is increasingly frequent.

Pathology.—Rachitis consists in a cessation of the deposits of the earthy constituents of bone in the layers of cartilage cells which form normally between the epiphyses and the shafts. Consequently these layers of cartilage do not ossify, and the earthy matters already deposited in the center of the bones are taken up by the continuous tissue changes, and not replaced by new material. Furthermore, no new deposit of calcareous salts takes place under the periosteum, which thickens and appears vascular and succulent. The bones likewise appear hyperemic and softer, and therefore can be easily cut with scissors, especially in rachitis of the cranium. The periosteum cannot be loosened without drawing away with it small portions of the attached bone, which appears soft and spongy directly beneath the periosteum, but grows more compact toward the center. In rachitic bones the calcareous salts are diminished about one-half, and even when the rachitis has been cured, it leaves behind it distinctive marks. These consist in a final ossification of the whole former soft mass of bone into a compact, thick, bony substance, thus retaining its pathological original thickening (sclerosis, or eburnatio). The cranium remains larger, and its vault thickened. The weight of the bone is strikingly increased, occasioning the bending of the

hollow bones, which remain bent, if they have not received timely treatment, *e. g.*, if there has been marked rachitis of the thorax, atelectasis is apt to be left behind. Rachitis of the cranium—*craniotabes*—which is observed as early as the third month, consists of a hypertrophy of the cartilaginous layers of the sutures, which therefore appear broader. The fontanels are larger, and ossify later, and so very gradually that the great fontanel has been found open until the ninth year. The cranial bones, especially near the sutures, are soft. The occipital protuberances alone always remain hard; and often can be found more or less numerous soft spots, from the size of a pea to a cent, on the occiput, or a larger portion of the bone is yielding and parchment like. The latter condition is sometimes found also in healthy children. In the round, soft places the bone is entirely absent; the thick and opaque pericranium and dura mater touch each other. This, according to Kormann, is caused by the pressure of the convolutions of the brain on the softened bone. The growth of the facial bones is also defective, and this arrest of development is seen most markedly in the cutting of the teeth. When rachitis occurs early, the first tooth frequently does not appear until toward the end of the first year; or if the rachitis begins about the end of the first year of life, then the pause between the first and second period of dentition is disproportionately long. The teeth already cut are deficient in enamel, early become black, and frequently fall out, though this is denied by Carpenter, except in syphilitic children.

The rachitic trunk is short and possesses the characteristic pigeon or chicken breast deformity—*pectus carinatum*. Usually there may be found also on its surface a horizontal depression or furrow, known as Harrison's Groove, which may be detected during the first year of life. The cartilaginous, sternal extremities of the ossified or softened ribs can be felt projecting as thick knobs, the so-called rachitic rosary. The development of the ribs is also retarded, and these are frequently found bent by pressure in lifting, or from their yielding during inspiration to the pressure of the atmosphere, and the inward traction of the diaphragm; thus the thorax becomes flattened laterally, occasionally drawn in concavely, and the sternum in consequence curves anteriorly, and

the apex of the ensiform appendage projects prominently. The transverse diameter of the thorax is lessened, and its antero-posterior diameter enlarged, although the cavity of the chest is smaller on account of the arrested development of the ribs. This is the origin of the acquired complicating *atelectasis* of the lungs, which in proportion to its gravity is one of the chief sources of danger to rachitic children.

The dorsal and lumbar vertebræ are also softened, and by carrying the child erect the spinal column becomes curved on itself posteriorly—*kyphosis*. This disappears when lying on the abdomen or lifting the child by the shoulders. There is also observed, quite often, a lateral curvature—*scoliosis*—of the spine which is always complicated with a spiral twisting of the same. Simple kyphosis may disappear, but kypho-scoliosis becomes permanent if not early corrected.

Rachitis of the pelvis develops itself at the same time with that of the thorax, and leads to those changes of form which are generally recognized later, and especially to be dreaded in girls, since these malformed pelvises make future confinements dangerous. These alterations in the form of the pelvis arise from standing or walking too soon, and especially from sitting on a hard floor.

Rachitis of the extremities results in a curvature of the softened long bones from the traction of the muscles attached to them. Injuries often of a very trifling nature may convert these curvatures into fractures. The earlier the functions of the limbs are taxed, the greater are these curvatures; early attempts at walking produce the well-known *bow-legs* and tottering walk; premature creeping causes *knock-knees*. Like other sick children, rachitics learn to walk of their own accord later than usual. If they have already commenced to run about, they forget how at the onset of rachitis, and must learn anew to walk from their second to fourth year, sometimes much later. Rachitic children can very easily thrust their toes into the mouth, on account of the ligaments of the joints being relaxed.

Course.—When recovery from rachitis begins—generally about the second year, though often much later with improper diet—the cranial sutures and fontanels become smaller. The thickened pericranium again deposits earthy matters, at first in the

frontal bones, which now appear considerably thickened, giving the cranium a square appearance—*caput quadratum*. Finally, the loss of bone substance in the occiput is repaired with earthy matters, and retarded development again proceeds more rapidly than normal. The bones begin to grow again, whereby their cortical portions become very compact and thick. All the curvatures may become gradually remedied, and only the inflections remain persistent. It is only when rachitis has been of several years' duration that the body remains small, forming a marked contrast to the relatively large head.

Prognosis is generally good for recovery from disease itself, but the complications are often dangerous, *e. g.*, in craniotabes, laryngismus stridulus may produce death; in thoracic rachitis with kyphoscoliosis we may have fatal results from secondary atelectasis, cardiac hypertrophy, capillary bronchitis, or lobular pneumonia. Pelvic rachitis is not infrequently the cause of death in later childbirth.

For complete cure there ought not to be the slightest disturbance of digestion, but frequently this is a disagreeable complication of rachitis, thus aggravating the disease and greatly delaying its recovery.

Prophylaxis.—Good air, proper food, and a wet-nurse if necessary. (Goodhart.) One of the most preventable of diseases.

Etiology.—The bad health of the parents may act as a predisposing or hereditary cause, but the exciting cause is always the want of fresh air and proper nourishment. Inter-uterine rachitis is the result of deficient nourishment of the mother, or of a pathological condition of the placenta. Rachitis attacks both children who have not been nursed at all and those who have been nursed too long, and, furthermore, those who have been fed too early with starchy food, which easily produces diarrhea, and, lastly, those who have passed through any serious disease affecting unfavorably the digestive organs, *e. g.*, measles, pneumonia, and diarrhea, are liable to be afflicted with rachitis. It is also found that more children are attacked in large cities than in the open country, and toward the end of winter than during summer. Rachitis always begins before the close of the first period of dentition.

Symptoms.—Generally during or after a persistent diarrhea

there appear increasing uneasiness and sensitiveness to touch, especially in lifting. The phosphates in the urine are increased three or four times, for the earthy constituents of bone are eliminated from the body, not deposited; soon follow profuse sweating and bronchial catarrh. The growth and form of all the bones are disturbed, most evidently in the rachitic extremities. First comes swelling of the wrists—articular ends of the radius and ulna—and then follows the thickening of the ankles, or the distal articulations of the tibia and fibula. This thickening results from an exuberant growth of the cartilages, the traction of the muscles passing over the joint, and the reciprocal pressure between the articular extremities themselves. On account of this hypertrophy the long bones increase less in length and become flexible. Consequently the traction of the muscles inserted in the bones produces numerous changes of form, giving rise to various bone distortions, and quite often to bending of the long bones (infractions) of the lower leg and forearm, whose return to their normal position is prevented by the action of the same muscles. The forearm and thigh appear bent anteriorly outward, the upper arm to the outside, and the tibia and its lower third is bent anteriorly. Craniotabes, or rachitis of the cranium, manifests itself in profuse sweating of the head, which bores into the pillow with continual uneasiness, and this continuous rubbing of the head to and fro produces, later, complete baldness of the back part of the head. A change of position pacifies the child, most perfectly when it is lifted up or laid on its abdomen, thus leaving the back part of the head free from pressure. Pressure upon the exposed brain leads to various forms of convulsions, and especially to spasm of the glottis. In rachitis of the thorax, as a rule, the children cry on being lifted, but are quiet on being laid down.

Progress.—Generally the disease is without fever and is chronic, lasting for several years, and, if neglected, resulting in permanent deformity of the bones.

Dietetic and Hygienic.—Very often protracted nursing is to blame and must be prohibited, and feeding on soup, meat juice, milk, and eggs must be ordered. In addition to cleanliness, plenty of fresh air must be insisted on, and, where possible, salt baths are valuable adjuvants.

The following diet table may prove of value:—

DIET TABLE FOR RACHITICS, TWELVE TO TWENTY-FOUR MONTHS.

Breakfast.—Milk or cocoa, with toast or cracked wheat.

11 A. M.—Milk and lime-water.

2 P. M.—Chop, gravy, and stale bread; cauliflower.

6 P. M.—Like breakfast, or egg, if not meat at noon.

8 P. M.—Milk and lime-water.

(29)

R. Olei morrhuæ,

Glycerinæ, āā ℥ ij

Ext. malt, ℥ iv

Ess. gaulther., ℥ j.

Mix thoroughly and give one to two teaspoonfuls an hour after meals.—H.

Medicinal, etc.—Cod-liver oil, either phosphorized or in the form of the above emulsion, stands at the head of all remedies. But in the giving of cod-liver oil it should be remembered that only that which is assimilated is of any value, and that it is most quickly assimilated when given about an hour after eating, when it is not apt to spoil the appetite for the next meal. Others speak very highly of the syrup of the lactophosphate of lime in rachitis, also of minute doses of phosphorus.

2d. Removal of all disturbances of digestion by the use of pepsin, etc., before meals. If diarrhea, check by opiates or astringents, as tannate of quinine or cato.

3d. In craniotabes, it is necessary to provide some suitable rest for the softened occiput, such as a horse-hair pillow with a pear-shaped aperture for the head. For the sweating of the head wash it frequently (hourly) with cold vinegar or water containing alum.

4th. When there is rachitis of the chest, lift the children carefully by the neck and buttocks.

5th. When the disease has already run its course supports are of no use, but resection of wedges of bone from the deformed limbs must be made, but in the earlier stages of the disease deformity apparatus is of immense value. No rachitic case should ever be left to nature to correct, but should be taken as early as possible to the orthopedic surgeon whenever possible. Simple bowlegs

can usually be corrected by pressure and aggravated cases by forcible straightening, even should this result in fracture, which is usually followed by good results if treated immediately with plaster bandages.

4. SCROFULOSIS.

Synonyms.—Scrofula; scrofulkrankheit, “King’s Evil.”

Definition.—The writer is one of those who is old-fashioned enough to believe that there is, in many children, a pretubercular tendency, remediable if treated in time, to which it is convenient, if not scientific, to affix the name of scrofula, since the majority of these children recover and may never suffer from general tuberculosis.

Etiology.—The predisposing cause is descent from weakly parents, one of them at least generally being in a cachectic condition from chronic pneumonia, phthisis pulmonalis, syphilis, previous scrofula, etc. But scrofula is not always hereditary; too often exciting causes produce the disease *de novo*. These causes are, faulty nutrition, such as too much starchy food before the ninth month, excess of bread, potatoes and vegetables in second and third year, bad air in underground lodging, or from too many persons in a room, or the general bad air of large cities.

Symptoms.—Scrofula, which is often joined with an especial quickness of intellect and comprehension, may remain for a time latent until some external influence causes its outbreak. This exciting cause may be vaccination, a wound, frequent chilling of the skin, or certain diseases, especially measles or whooping-cough, always to be dreaded in all families in which the elimination of effete material is known to be tedious. Hence, even a cold does not get well, but returns again and again and is attended with chronic engorgement of various organs, as the lymphatic glands, eyes, and mucous membrane. The subcutaneous tissue often becomes adipose. The muscles and the surface of the skin are anemic and relaxed, the latter perspiring easily. On the skin we may find *eczema simplex* or *rubrum*, whose vesicles dry in yellowish-brown crusts, beneath which fluid generally oozes forth. This is especially so on the face, nose, ears, and hairy scalp, forming there *eczema capillitis*. Or we may find *tinea capitis*, porrigo,

or impetigo, distinguished by pustules which form scabs, or ecthyma, beneath whose large pustules the skin ulcerates. Lupus is found under the varieties, exfolians, exulcerans, serpiginosus—which latter is the so-called *salt rheum*, found especially on the face, nose, and cheeks. Lichen is known by groups of whitish papules, and often requires, like the previous-mentioned eruptions, a very long time for its cure, which can be hastened only by constitutional treatment. The same is true of the inflammation of the glandular apparatus in the border of the eyelids—*adenitis meibomiana hordeolum*—where the lids thicken and the lashes fall out. The mucous membrane of the nose is especially apt to be affected with a chronic catarrh which produces eczema and intertrigo of the upper lip and nostrils, and the swelling of the upper lip and nose, the condition known as scrofulous ozena, resulting from the ulceration of the periosteum of the cavity of the nose. Not infrequently there is a separation of a sequestra, which always makes itself known by a most offensive odor, and a thin, purulent discharge. Moreover, the mouth often shows hypertrophied tonsils and chronic pharyngitis, as a complication of the above.

The eyes are prone to *herpes conjunctivæ et corneæ* and keratitis scrofulosa and episcleritis with secondary blepharospasmus, with spasm of the lids (nystagmus) in consequence of photophobia. The most important of these is keratitis, which may lead to the loss of sight, perforation of the cornea, and formation of staphyloma. Superficial or deep cicatrices are certain to remain. These are the nebulous maculæ corneæ, or white spots, which interfere more or less with vision, according to their position. A chronic catarrh of the external auditory meatus may affect the ear, accompanied with an offensive discharge and an eczema of the surrounding parts. *Otitis interna* proceeds from periostitis of the middle ear, and may terminate in caries or necrosis of the petrous or mastoid processes of the temporal bone, with secondary purulent meningitis and formation of an abscess in the brain, and sudden death, though this is rare.

In all scrofulous diseases of the skin, mucous membranes, and organs of sense, all the *lymphatic glands* whose vessels pass through the affected parts become secondarily hypertrophied.

In a longer or shorter time after the cure of the skin or the mucous membranes these glands diminish in size, or this may occur in the majority of them, while others become caseous or tuberculous. Very rarely, in the lymphatic glands of children, the process of calcification which is sometimes observed later in life takes place. Usually, these glandular tumors, which were at first movable under the skin, soften at the center, and become fastened to the skin, which becomes reddened at this point, through which at last the gland empties out its contents—a sero-purulent fluid or pus containing particles of a caseously degenerated gland. If these abscesses, which frequently communicate with one another, are left to themselves, they change into long fistulous openings, which often discharge for years a thin pus, and are sure to leave behind them disfiguring, arborescent scars. But caseous degeneration of the internal lymphatic glands is of even greater importance, especially that of the bronchial and mesenteric glands leading to bronchial tuberculosis and tabes mesenterica. Since these internal glands cannot evacuate their contents externally, more or less destruction of internal organs must result from the opening of these lymphatic abscesses into the esophagus, intestines, trachea, or cavities of the lungs, or still more rarely fatally into the aorta.

Finally, the *periosteum* and all osseous structures may become diseased, producing acute or chronic periostitis and ostitis scrofulosa, now recognized as tubercular. This especially affects the spinal column—spondylitis, Pott's disease, properly named spondylarthrocace—and the tibia, femur, and humerus are also exposed to the same fate. Periostitis rarely ends in resolution, but generally in suppuration, the pus discharging externally through fistulous openings. At the same time the bone becomes inflamed, and that part of the bone which is no longer nourished by the caseously-infiltrated periosteum generally dies. This sequestra is cast off by the suppuration of the surrounding parts—*caries seu ulceratio ossis superficialis*. The marrow also frequently inflames, resulting in scrofulous osteomyelitis, or endostitis. Extravasation of blood into the hyperemic marrow generally produces suppuration—*caries centralis*—whereupon the bone likewise dies—*necrosis centralis*—as its internal supply of blood is cut off. Finally, the periosteum also shares in the inflammation, and the result is

the same as in scrofulous periostitis, except that in such cases the fistulous passages always open into the medullary cavity. Sometimes there is a wonderful increase in the size of the bone with a diminution of its substance. This originates from an absorption of the bone substance and a consequent enlargement of the medullary cavity, while at the same time the periosteum throws out new layers of bone, which are partially destroyed by absorption—*osteoporosis*—*spina ventosa*, etc.

The joints are very often attacked, and in these cases the pus resulting from the inflammation of the articular extremities of the bone breaks through into the cavity of the joint, and rapidly causes there an ichorous inflammation—*arthrocace*, especially *coxarthrocace*. Or the synovial membrane may become first inflamed and produce a large quantity of the granulations known as fungus articuli—*tumor albus*, or "white swelling." The most frequent and important of these are the inflammations of the hip-joint—*coxitis scrofulosa*, or hip-disease—and the inflammations of the knee-joint—*gonitis scrofulosa*, or *tumor albus genu*. Next in frequency are the inflammations of the elbow-joint—*olecranonarthrocace*—and those of the ankle-joint—*podarthrocace*, or *tumor albus pedis*—all now believed to be tuberculous.

Secondarily, as a consequence of protracted suppuration, all the internal organs may become diseased. This may take place under the form of amyloid degeneration, which most frequently attacks the liver, spleen, and kidneys.

Progress.—Scrofula is always a chronic disease, but may end in a perfect cure, even after amyloid degeneration has occurred. It may, however, and does not infrequently, lead, as has already been noted, to fatal tuberculosis.

Prognosis.—The affections of the superficial lymphatic glands, skin, and mucous membranes have a tolerably good prognosis. The prognosis of scrofulous diseases of the lungs, bones, bronchial and mesenteric glands, as well as amyloid degeneration, is worse. The appearance of tuberculosis generally allows of no reasonable hope after the recognition of the bacillus tuberculosis in the sputa by a competent microscopist.

Prophylaxis.—Good air and food and the use of frequent cool, and in summer cold, salt baths by those who inherit the hereditary

diathesis. Good food is of especial importance, four meals a day, *e. g.*:—

Breakfast.—Cocoa, egg, toast, butter ad lib.

10 A. M.—Warm milk and lime-water, cracker.

Dinner.—Chop, steak, gravy, stale bread, cauliflower, oysters.

6 P. M.—Same as breakfast, or peptonized meats.

Sea air is especially helpful in all cases of suspected scrofula, and can hardly be too strongly insisted upon during the summer, when the means of the parents will allow it.

Treatment should be both general and local. General treatment is most important, because without it no permanent improvement can be made, notwithstanding persistent local efforts, and, *vice versâ*, general treatment is essentially aided by local remedies. First of all, good air must be secured in the country, among the mountains, at the seashore, or in summer dwellings. Then there must also be good nourishment, at first a wet-nurse, then milk, meat, broths, eggs, ripe fruits, and the most nourishing foods. Potatoes, puddings, and fresh bread are to be entirely forbidden. Cod-liver oil stands at the head of all medicines (an emulsion may be commenced with, and later the common oil used), and is to be given in doses of one-half to one tablespoonful three times a day, one hour after meals. It is only contraindicated in diarrhea, gastric catarrh, inflammations, and feverish conditions. In case cod-liver oil does not agree with the children, fresh cream, the iodid of iron, syrup ferri (gtt. v–xx), in water, may be given instead; or iodid of potash (gr. iij–viiij) daily, in syrup of coffee or ginger, or the saccharated carbonate of iron, as much as will lie on the point of a knife, *i. i. d.*, may be prescribed. Sea and salt baths are always supporting. They may be artificially substituted by common salt baths (one-half to one pound), used at first for one-fourth of an hour, and later for one-half hour.

Skin diseases demand, first, cleanliness, the crusts then to be removed by oil, etc., and after which removal, ung. præcip. or ung. oxidî zinci may be applied. In scald head, the hairs are also to be removed, and scratching is always to be guarded against by cutting the nails twice a week, and putting the child's hands in bags at night. Indolent ulcers are to be stimulated by applications

of nitrate of silver, and lupus scraped or cauterized with chlorid zinc or trichloracetic acid. Arsenical powders must not be used with children on account of the ease with which they become poisoned. In ozena, disinfecting and astringent solutions are to be applied with a nasal douche or DeBilviss' spray.

Scrofulous ophthalmia, accompanied by photophobia, requires local use of ung. hyd. oxid. flav. (gr. ij- $\bar{3}$ j) and the free administration of opiates for pain. All heating bandages must be left off, and a single layer of silk tied over the eyes. Dropping into the eye of a solution of sulphate of atropin, or warm collyria of boracic acid with ext. belladonna (1 : 40), one half to one hour at a time, should be employed several times daily.

When there is inflammation of the external auditory meatus, use weak injections of peroxid of hydrogen and deodorizing lotions several times a day. In deep-seated diseases of the eye and ear the specialist ought always to be consulted.

When there is a swelling of the lymphatic glands the organs from which the lymphatic vessels arise must be carefully examined. If the glands remain enlarged after the cure of the original disease, we should endeavor to bring them to resolution by painting them with tincture of iodine or the use of ung. ext. phytolac. decandr. ($\bar{3}$ j- $\bar{3}$ j). Inevitable softening of the lymphatic glands is to be promoted by stimulating salves and plasters, and when there is great softening an opening may be facilitated by tapping with the needle of a hypodermic syringe. Incisions are contra-indicated because they leave disfiguring, gristly scars, and for the same reasons, after the spontaneous opening of an abscess, the callous borders of its fistulous openings are to be snipped and the cavity scraped. When the periosteum, bone, or marrow is affected rest is indicated, with cold compresses in the initial stages. When suppuration begins, poultices and proper position should be attended to, with the extraction of sequestra and resection of the joint according to antiseptic surgical principles. In major operations of this kind the surgeon's assistance is required, but it should be remembered that unless the general constitutional condition is also looked after, permanent cure can rarely be obtained even by his aid.

5. PURPURA.

Synonyms.—Morbus Werlhofii, Peliosis rheumatica.

Varieties.—(a) Purpura simplex, or that where the hemorrhage is confined to the subcutaneous tissues; (b) purpura hemorrhagica, or that where the hemorrhage is from the mucous membranes. Occasionally hemorrhage takes place from the sweat glands and we have a hematidrosis. Purpura rheumatica is attended with pain in the joints about which the spots chiefly appear. For purpura neonatorum see *Septic Infection*.

Etiology.—May arise from any of a large number of causes, some of which, as hemophilia and syphilis, are congenital. More frequently it is found as a complication in severe cases of the specific fevers, as cerebro-spinal meningitis, smallpox, scarlatina, measles, or malaria. Again it is met with in diseases attended with serious alterations in the composition of the blood, hence purpura may complicate typhus, typhoid, septicemia, pyemia, rachitis, anemia, pernicious icterus, scorbutus, morbus Winkellii, acute dysentery, and serpents' bites. We also see various medicinal purpura caused by the administration of phosphorus, mercury, quinin, potassium iodid, choral, salicylic acid, and various other coal-tar products in those possessing a purpuric idiosyncrasy. Lastly, there are attacks of purpura caused by mechanical causes located in either the heart, liver, or kidneys, or from sudden changes produced in the circulation caused by falls, fright, pertussis, etc., and under this head perhaps is to be included the so-called neurotic purpura.

Symptoms.—Generally preceded by a few days of uneasiness and pain in the limbs, which may escape attention until reddish or bluish stains appear upon the skin which do not disappear upon pressure. These purpuric spots are known as petechiæ when they appear as minute points, vibices if they are streaky, ecchymoses if in the form of spots or blotches, which may be combined with other skin lesions, as urticaria, papules, or bullæ. Purpura simplex resembles at first flea-bites and then passes through the change of color incident to an ordinary bruise. Purpura rheumatica is usually attended with moderate elevation of temperature, rheumatic pains, and not infrequently with cardiac complica-

tions. Purpura hemorrhagica is the variety most to be dreaded, for it is that form in which bleeding may take place from any mucous membrane or into any internal organ, often to a large amount from the nose, mouth, or intestines, less frequently from the stomach (hematemesis). Or hemoptysis may announce pulmonary hemorrhage, or hematuria that into the kidneys or bladder, and even more serious are the internal hemorrhages which may produce hemorrhage, pleurisy, pericarditis, or meningitis.

Course.—The disease is rarely attended with fever unless hemorrhage takes place into a serous sac. Relapses are frequent even in *p. simplex*, which usually lasts about a week. Purpura hemorrhagica may produce the symptoms of collapse, filiform pulse, blanched skin, unconsciousness, or, if the hemorrhage has been meningeal, convulsions. The prognosis is good so long as the hemorrhage is simply ecchymotic; if into the serous membranes, the disease is always dangerous. In hemorrhophilia the prognosis is discouraging.

Treatment.—Perfect rest, good nourishment, preferably liquid, in the form of milk, broths, or soups. Medicaments: ergot, ergotine, mineral acids, quinine, *p. r. n.* For pulmonary hemorrhage, bits of ice, atropin—hypodermically—iron, *fl. ext. hamamelis*, etc. For intestinal hemorrhage, vinegar enemata, and in obstinate epistaxis, tamponade. For that form known as *peliosis rheumatica*, *tinct. ferri chlor.* (gtt. ij–v), with a roller bandage and cotton wool about the swollen joints, acts like a specific.

Prophylaxis.—In hemorrhagic families special care must be taken to avoid all injuries, such as blows, cupping, or even drawing the teeth, for such children, even with the greatest care, sooner or later succumb to some trivial injury.

6. RHEUMATISM.

Etiology.—As its name suggests, the disease probably arises from alteration in the normal composition of the fluids of the body, usually supposed to be due to an excess of lactic acid in the system, although this has not yet been chemically proven. So much as this, however, may be taken for granted, *viz.*: that rheumatism originates in imperfect elimination and the retention of waste material, which produces inflammation of various fibrous and serous

tissues of the body. Chief among these are the joints, heart, and pericardium, although any fibrous or muscular structure may be thus attacked. These attacks are usually precipitated by sudden changes in temperature, wetting, residence in damp dwellings, chilling of the surface of the body, and errors in diet, especially the free use of malt liquors or the use of heavy wines. Heredity seems to have much to do with the predisposition to rheumatic attacks, nearly one-third of those thus suffering having had either a rheumatic, or gouty father or mother. This tendency may be shown very early in life, even within a few hours after birth, if the mother had suffered from rheumatism at the time of her confinement. Unlike the rheumatism of adult life, more girls than boys suffer, and although it is said not to be often seen before six years, the writer is convinced that children of much tenderer age often suffer severely from rheumatism.

Pathology.—Injection of the synovial membranes of the joints, often with effusion of fluid into them and swelling of the cartilages. Fibrous nodules are apt to form about such joints and sometimes upon the tendons of the muscles of the back. These latter, which are rare in adults, are by no means uncommon in children, and vary in size from the head of a pin to a small cherry, but are not permanent, usually lasting for only a few weeks, although they may persist for months. More frequently they appear in returning crops, and are usually considered proof of co-existing endocarditis or pericarditis, which are relatively distressingly frequent in children. The pericarditis may spread to the anterior mediastinum, and fibrous coagula in the heart are usual at autopsies. Pleurisy is frequent, usually left-sided, but it may also be double; and less frequently we find instead a pleuro-pneumonia. Erythema nodosum and urticaria are probably vicarious manifestations of the rheumatic poison.

Symptoms.—It should be remembered that articular symptoms are relatively less prominent with the child than in the adult. The same is true of the profuse acid sweating so frequent with the adult. On the other hand, wandering rheumatic pains—the so-called “growing pains”—and rheumatic tonsillitis are among the more frequent symptoms of rheumatism in children. Pain, fever, swelling of the joints, and heart symptoms are, of course,

met with in typical cases of rheumatism, but of these the heart symptoms are the ones which are prone to overshadow the rest, and the ones chiefly to be dreaded. Pain is quite apt to be slight and more of the nature of tenderness and disinclination to move rather than sharp pain, and hence is often mistaken for a sprain. Fever is, as a rule, neither high nor long continued, so that the heart symptoms are often the first to attract the attention of the parents. It is not always easy to decide whether we have to do with endocarditis, pericarditis, or both combined; but while it will be found that both are attended with restlessness, labored breathing, and elevated temperature, we expect to find a mitral murmur in endocarditis, systolic and near the apex (ulcerative endocarditis is attended by fever and chills). Pericarditis generally is more painful than endocarditis, generally gives friction sounds, with the cardiac sounds more distinctly at the base than at the apex.

Diagnosis.—It is by no means always easy to make a positive diagnosis of rheumatism in a child unless there be coincident heart trouble. A rheumatic family history, recurrent tonsillitis, or chorea, may give us valuable hints as to the attack, but the effect of anti-rheumatic remedies are often the best means of differentiation in doubtful cases.

Treatment.—First, and foremost, the child should be clad in a flannel nightgown, put to bed, and kept under blankets until pain and tenderness have disappeared. If the joints are swollen and tender, they should be wrapped in cotton batting after rubbing with liniment, one of the most efficient of which is the following:—

(30)

R. Olei gaultheriæ, *opt.*,
 Spir. chloroformi, aa $\overline{3}$ ss
 Lin. saponis, $\overline{3}$ iij. M.
 S.—To be applied for the relief of rheumatic pains.—M. P. H.

Of internal remedies salicylate of soda justly holds the first place, though it sometimes produces hebetude and depression of the heart's action without any appreciable effect in warding off heart complications. Da Costa prefers the bicarbonate of soda in mint-

water until the urine becomes alkaline, and the author thinks very highly of salicin, especially in subacute cases in anemic children. Quinin sometimes works wonders after all the usual remedies have failed, and opiates are permissible for pain, especially codein.

Iodides are our chief reliance in pericarditis and endocarditis where absolute rest must be insisted upon.

Prognosis.—Good as regards life, especially in first attacks. General mortality $3\frac{1}{2}$ per cent., but it should be remembered that apparent cures very often leave heart lesions behind from which, many years later, such children die.

The course of rheumatism in the child depends largely upon the nature and character of its heart complications. Da Costa fixes the average as between two and three weeks; Goodhart much less, but there is hardly any disease either in the adult or child which is more liable to relapses and exacerbations upon slight provocation. Resulting anemia is very prone to be tedious.

7. SCORBUTUS.

Synonym.—Infantile scurvy.

Definition.—A diet dyscrasia, arising from lack of fresh food, and characterized by anemia, spongy gums, and subperiosteal hemorrhagē.

Etiology.—Bad hygienic surroundings, combined with food deficient in fresh vegetables and meat, will invariably produce scurvy, even in persons previously healthy. Gradual starvation from disease, as typhus, or from improper infant foods, give rise to scorbutic symptoms, which are increasingly frequent with the increase of starchy, proprietary infant foods, especially those that do not call for their mixture with fresh milk. Hence, like rickets, infantile scurvy is more frequent in this country, unless much of that previously existing has been confounded with purpura or rheumatism by earlier writers.

Symptoms.—Such children are anemic and irritable and hate to be handled, and are disinclined to move the lower limbs. There is marked tenderness about the knee, ankle, or thigh, the latter of which not infrequently shows a fusiform swelling and loss of use of the limb. Then comes swelling of the gums, with tenderness

and bleeding if teeth have been cut. As in simple ulcerative stomatitis, the edges of the gums become swollen, reddish blue, and the teeth loosen. In severe cases ulceration ensues with a gangrenous odor and the dribbling of an offensive reddish-brown saliva. Hemorrhage may occur also from the tongue, mucous membranes, or anywhere from the surface of the body.

Differentiation.—In rheumatism the swelling is apt to be circumferential instead of fusiform, and the joints are red and hot to the touch. Ulcerative stomatitis gives a history of some previous disease, and the oral mucous membrane is hyperæmic, while in infantile scurvy the mucous membrane of the cheeks and hard palate is always anemic.

Pathology.—According to Northrup, the pathological changes are those of emaciation, ecchymosis, and subperiosteal hemorrhage of the femora, often with detachment of the epiphyses. The tibia may be similarly affected and the gums are swollen, spongy, and blood stained.

Treatment.—Fresh food is the specific for infantile scurvy, as it is in the adult, hence the use of all artificial foods should be at once interdicted and the child put upon milk and fresh meat juices. The milk may be sterilized or Pasteurized if it otherwise disagrees with the child, otherwise it should be used raw, and the beef juice should be expressed from partially cooked meat with a lemon squeezer, or press, just before giving. If the child is older, scraped beef, lettuce, potatoes, and acidulous fruits will hasten the cure. Astringent mouth washes, such as ʒss tinct. of myrrh to ʒviiij water, will add much to the comfort of the child, and if gangrene has occurred swabbing the mouth with a dilute solution of permanganate of potash should be practiced as required to remove the odor. If the anemia is great, iron will hasten its cure. Dilute muriatic acid and pepsin may be required for enfeebled digestion and quinin inunctions (ʒj to ʒj lanolin) when the stomach will not tolerate its internal use.

Prognosis.—Excellent when timely change can be made from errors in feeding and hygienic surroundings. The occurrence of scorbutus ought to be considered as evidence of criminal ignorance, to be prosecuted, as are captains who allow it to appear on shipboard.

SECTION V.

THE ACUTE INFECTIOUS DISEASES,

or those which are known to be contracted from those previously sick of the same disease, are smallpox, diphtheria, scarlet fever, chicken-pox, measles, rotheln, pemphigus, influenza, whooping cough, syphilis, and mumps, all of which are now believed to be due to the introduction and growth in the body of the specific microorganisms producing these various diseases.

1. VARIOLA VERA.

Synonyms.—Smallpox; Pocken; Blattern.

Symptoms and Course.—Smallpox and its modifications of varioloid in the child, differ in no respect, either in etiology, stages, course, or complications, from the same diseases as seen in the adult.

Differentiation.—May be assisted by remembering the following table:—

| | Latent. | Appears after first rigor. |
|-----------------------|-----------|----------------------------|
| Scarlatina, | 4-8 days, | 18-24 hours. |
| Erysipelas, | 4-7 " | 24-26 " |
| Variola, | 8-14 " | 48 " |
| Rubeola, | 10-12 " | 72 " |
| Varicella, | 8-14 " | 10-12 " |

It should also be remembered that in smallpox there is first an erythematous blush, in the midst of which small hard papules appear—at first on the forehead—on which, by the aid of a magnifying glass, small vesicles may be distinguished. This serves to differentiate it from scarlatina and erysipelas, for which it at first might be mistaken on account of the initial erythema. Later umbilication makes the diagnosis certain.

Treatment.—During the prodromal stage, chloral hydrate, or antifebrin may be used with advantage for the atrocious head and backaches. Phenacetin and icebags may be indicated, if there is

threatened hyperemia of the brain. Kormann strongly advises the pricking of each vesicle early with a gold needle, and later touching with a strong solution of nitrate of silver. Others speak well of iodoform in glycerin, or powdered charcoal on cotton wool, for pitting is much less marked when the pustules are protected from the light. Diet should be light, and the bowels kept open, and the fever in check with antipyretics. Scratching must be prevented during the formation of scabs, if necessary, by tying the child's hands in small muslin bags. Dusting with starch, or applying boro-glycerin (50 per cent. solution) will sometimes allay the itching, which often is intolerable. Others rely upon equal parts of oil and lime water containing subnitrate of bismuth in suspension, and the thickened epidermis of the palms and scales may be softened by a strong solution of potash carefully applied.

Threatened septicemia should be energetically combated with the free use of quinin and alcohol. Gargling with a weak solution of permanganate of potash often relieves the throat, and a four per cent. solution of cocain lessens the pain in the ears.

Prophylaxis.—The prophylaxis of smallpox is one of the most important duties of the physician, whose neglect in isolating individual cases of smallpox, or carelessness in vaccination, can hardly be condoned. Revaccination, no matter how recently performed before, should be insisted upon after every known exposure of a child to the disease, for even if it does not prevent the occurrence of smallpox it will greatly modify its course.

Vaccination generally protects for from seven to ten years, and protection begins five days after vaccination (K.). It is performed preferably in the spring or early summer, before or between dentition, therefore best about the third or tenth month, unless the child should happen to be born during an epidemic of variola, when vaccination should be made as soon as possible after birth.

Vaccination may be made directly from arm to arm from a healthy vaccinia vesicle, or, as is more frequently done in this country, with a bit of ivory dipped in the lymph from a vesicle on the udder of a calf suffering from true cow-pox. It is not necessary to make an incision to insert the lymph, as is sometimes done. Thoroughly disinfect the skin and then criss-cross it, pre-

ferably over the deltoid, until it begins to ooze serum, and rubbing with the end of the ivory containing the virus, is far better than a deeper incision, as the flow of the blood often prevents the very thing it is designed to accomplish. The clothing should be kept away from the arm until the spot has entirely dried, and after this it usually requires no further attention. On the third to the seventh day the point pricked becomes reddened and slightly elevated into a nodule. A couple of days later (fifth) a clear vesicle appears on the summit of this, and soon shows umbilication, which is the time for taking lymph if direct vaccination from it is now desired. After the seventh day the vesicle transforms itself into a pustule, its contents becoming turbid and the surrounding areola redder. Often there is also slight fever, rise of temperature, restlessness, and thirst for a day or two. About the twelfth day the pustule begins to desiccate and the scab drops off, leaving an irregular, reddish cicatrix, which eventually becomes white, with fine pitting, if typical.

Vaccination does not always run the simple course here detailed, for all its symptoms may be intensified, and added to them the chill and fever of suppuration, convulsions, or fatal collapse. Urticaria and erythema are by no means infrequent with neurotic children, also eczema and ecthyma in those predisposed to scrofula, in whom sometimes the pustules obstinately refuse to heal, converting themselves into sluggish ulcers. Erysipelas may complicate when children are vaccinated in septic houses, and in such the erysipelatous inflammation may spread over the entire arm and trunk, and recovery not take place in two or three weeks. Treatment of such cases is, of course, the same as that of traumatic erysipelas otherwise produced. Syphilis is apparently the only disease which can be transmitted by vaccination, and hence the greatest care should be exercised in the selection of humanized virus, good bovine always to be preferred, and vaccination to be repeated at least as often as once in ten years and as much oftener as exposure takes place, since in no other way can we be sure that it still renders the child immune to variola. If this is thoroughly done the mortality falls to 0.3 to 100,000.

2. VARICELLA.

Synonyms.—Chicken-pox ; sheep-pox ; Windpocken ; “ crystal.”

History.—Name varicella by Vogel in 1764 ; its popular name of chicken-pox, being given from the resemblance of its vesicles to the chick-pea.

Course.—After a period of incubation of eight to fourteen days, either with or without a prodromal stage of one to three days of slight chill, short rapid rise of fever, pain in the limbs, vomiting, loss of appetite, etc., papules appear and develop in about one-half a day into vesicles, of the size of a pin-head to a pea surrounded by a red areola, rarely, and then but slightly, umbilicated. During the next few days the contents of the vesicles become sero-purulent and turbid, and generally after-crops of eruption appear, so that fresh vesicles and old stand side by side. After three to four days their contents dry into a thin crust, which becomes detached in two to three days, and unless there has been scratching, no cicatrix is left, but only a red spot. The vesicles appear thickly on the back, but the largest ones are generally found on the face, where they remind one of variola pustules. Often they may be found in the fauces also, causing cough.

Diagnosis.—The chief interest connected with varicella lies in its differentiation from variola, especially in its modified forms. This is not always possible from a single examination, but it may be helpful to remember that the papulation is more marked and prolonged in smallpox where the papules are a marked feature, while in chicken-pox the eruption never feels shotty, and becomes almost at once vesicular. Pustulation is the rule in variola, the exception in varicella, which is a very mild disease of brief duration, while the temperature remains high for five or six days in smallpox, rises again on the sixth to ninth, and continues elevated for ten days longer.

Treatment.—Chicken-pox rarely requires any treatment, except perhaps a mild laxative and dusting with starch to allay the itching, which is sometimes annoying.

Prognosis.—Always favorable except in those tubercular patients who are badly housed, and whose vesicles, instead of heal-

ing, become necrotic and constitute the so-called varicella gangrenosa.

3. SCARLATINA.

Synonyms.—Scharlach; scarlet fever; “morbilli ignei.”

History.—First described by Dr. Doring, of Breslau, in 1625, but up to the time of Sydenham (1670) was supposed to be a variety of measles, nor was its contagiousness understood until investigated by Fothergill in 1750. Since the disease came into America in 1735, it has constantly spread, until to-day it has become endemic in all our large cities, and rightly the most dreaded of the exanthemata of childhood. One attack, as a rule, protects from a return, though well attested reports of second and third attacks are on record, and recurrent attacks of sore-throat in nurses and physicians caring for scarlet fever patients are very common. The coexistence of scarlet fever and measles, or scarlet fever and varicella, is also possible.

Etiology.—It could be wished that we were possessed of more accurate knowledge in regard to the bacteriology of this disease, all of whose symptoms are best explained by a microbic origin. The specific bacillus is probably that figured by Dr. Edington, of Edinburgh, and named by him *bacillus scarlatinæ*. According to Dr. Shakespeare, this may always be found in the blood of a scarlet fever patient for the first two or three days of the disease, and later in the desquamating scales. The latter are probably the usual means for its dissemination, though the methods by which they may be carried are almost legion. It is entirely possible that the contagiousness of the urine and feces claimed by some is due to these poisonous particles which they contain. It is universally conceded that the stage of desquamation is the most dangerous, and during this the poison is frequently carried from one house to another by means of clothing, a third person, milk, letters, books, toys, and almost everything handled by those sick of scarlet fever, though the contagiousness of different epidemics seems to vary greatly. Children under six months usually escape, and those up to a year are fairly exempt.

Symptoms and Course.—The period of incubation varies from two to eight days, followed by the onset of the disease lasting twelve to forty-eight hours, characterized by chilliness, nausea,

high fever (103° – 106° F.), thirst, languor, and sore throat, with swelling of the lymphatics of the neck.

The scarlatinal eruption usually appears within forty-eight hours after the onset of the disease, as a scarcely perceptible scarlet flush or pin-point eruption, not unlike the color of a boiled lobster. This begins on the neck or cheeks and in forty-eight hours spreads over the entire body, either as a uniform redness or in large patches—*S. variegata*. Ruddy children show the rash more distinctly, which is intensified by the heat of the bed, crying, and hot baths. Until the eruption is well out, the fever continues high, often extremely so— 105° – 107° —the pulse quick and sthenic, except in cases of malignant scarlatina, when there may be general depression, delirium, and collapse. There is always a moderately painful sore throat and pharyngitis. The tongue is furred with a bright red tip and borders, "strawberry tongue," or the papillæ may be greatly swollen and cause the granular appearance known as "raspberry tongue." These symptoms disappear on the fourth day, after which the fever has only evening exacerbations, unless inflammatory complications cause a fresh increase. Next comes the stage of desquamation or "scaling." Those places which first became red fade in like order, though for awhile the loins and thighs increase in redness. Accompanied with great itching of the face and neck its epidermis becomes cracked and cast off in shreds, or lamellæ, the hands and tips of the fingers shedding these most abundantly, especially after a well-marked erythema. Desquamation also occurs from the attacked mucous membranes of the tongue, throat, trachea, kidneys, and intestines.

This is the natural course of a typical case of scarlatina, but we find variations, such as—

(a) *Scarlatina sine angina*, or a scarlatina without a sore throat.

(b) *Scarlatina sine exanthema*; very difficult to diagnose and usually very fatal in its results, only recognized by the appearance later of scarlet fever among other members of the family. In some of these cases desquamation occurs, proving that an eruption probably took place, of only a few hours' duration.

(c) *Scarlatina papulosa* is another variety, in which the papillæ of the skin become swollen and the whole surface of the body assumes a "goose-skin" appearance.

(d) *Scarlatina miliaria* is a modification of the last, in which these papillæ are covered with vesicles.

(e) *Scarlatina petechialis*; most dangerous of all. See Purpura.

Complications and Sequelæ.—The most frequent of these is an intensification of the ordinary *angina* of scarlatina into a diphtheritic form, in which more or less of the tonsils and uvula is covered with a grayish-white membrane. When this is removed the superficial layers of the subjacent mucous membrane will be found destroyed, and in malignant epidemics of this variety of scarlatina this may proceed to actual gangrene of the tonsils and their surrounding parts. Or the diphtheritic inflammation may extend up the Eustachian tubes and result in permanent deafness. Or a croupy metallic cough informs us that the membrane has extended into the larynx. When the nostrils are similarly affected with a diphtheritic coryza, there is a profuse, thin, excoriating discharge from the nose, often exceedingly offensive in odor, and septicemia is usually not far distant. Even in mild forms of diphtheria, septicemia is possible from the later inflammation and suppuration of the parotid, or lymphatic glands, though, as a rule, it will be found true that the involvement of the lymphatic glands is in direct proportion to the severity of the throat lesions.

(b) *Diarrheas and dysenteries* sometimes occur during the same stage of the disease, and are produced probably by desquamation of the intestinal epithelium.

(c) The *tubuli uriniferi*, like the intestines, normally shed their epithelium at this time—epithelial casts in urine—but often there is a true hyperemia of the cortex, and even inflammation of the convoluted tubes associated with this, so that hyaline casts also appear in the urine, and if a large portion of the kidney is implicated, death may result from the uremia of a morbus Brightii acutus, or from dropsy, described later.

(d) More limited *disease of the kidney* may cause localized edema, such as ascites, hydrops pleurohydrothorax, hydrops pericardii, edema of the lungs, or dropsical effusion into joints. Such complications not infrequently follow a short apparent convalescence, during which the children recover their appetite and exhibit nothing abnormal except perhaps slight lassitude. Then appear loss of appetite, depression and pain in the region of the kidney—

one or both. The amount of the urine is greatly diminished ($\frac{3}{4}$ iv- $\frac{3}{4}$ x in as many days). It is concentrated, bloody, and contains albumin and casts. In a few days the whole body becomes bloated, hands, face, and feet simultaneously, and respiration becomes short, superficial, and labored, so much so that the child can sleep only in the sitting posture, and grasps eagerly any object which promises to aid the pectoral muscles in their effort to expand the chest. If the case is further complicated with hydropericardium, the pulse becomes small and irregular and precordial distress is very marked. Such cases generally end fatally, either from fatty degeneration of the kidney and consequent uremia, or suddenly from heart failure or edema of the glottis. But if the kidney lesion be confined to a small area, the albumin may gradually disappear from the urine, the dropsical effusion may be absorbed, and a slow recovery effected.

(e) All varieties of scarlet fever implicate to a greater or less degree the lymphatic glands of the neck, giving rise to cervical *adenitis*, which varies from slight engorgement to a brawny collar, encircling the neck. Excess of zeal in treatment of these swollen glands often leads to suppuration, sloughing, and death from exhaustion or hemorrhage.

(f) More rarely *serious cerebral affections*, such as paralyses, blindness, aphasia, loss of memory, or idiocy, remain as sequelæ of scarlatina.

(g) *Rheumatic pains* in the joints should have been spoken of among the symptoms of the third stage of scarlatina, and articular rheumatism, with or without pleuritis or endocarditis, is one of its not infrequent sequelæ. It may successively attack all the joints of the body, and occasionally leads to suppuration.

(h) *Noma* has also been known to follow scarlatina, in very unsanitary localities, and multiple abscesses are by no means infrequent.

Prophylaxis.—Next to the care which should be taken to restrict the spread of smallpox, it is incumbent upon the family physician to see that similar care is exercised in regard to scarlet fever, which is contagious from the initial sore throat until the last branny scales, usually between the fingers or toes, have been removed. Six weeks' quarantine is none too long for an average

case of scarlatina, and this must be lengthened if desquamation is not finished by that time. If possible, other children should be sent from the infected house, until recovery has taken place and all rooms occupied by the sick and their attendants have been disinfected. This is most easily done by burning a pound of sulphur in each room, closed as tightly as possible, and then thoroughly scrubbing and ventilating before again occupying the room. All sheets, bedding, towels, and articles that can be washed should be immediately thrown into boiling water as soon as used, and visiting friends and neighbors absolutely forbidden. Sulphocarbonate of soda has some reputation as a prophylactic (gr. ij-v. t. i. d.).

Treatment.—For the initial sore throat, vomiting, and fever, little medication is required. If the nausea is annoying, the following will be found useful:—

(31)

R. Aquæ calcis,
 " cinnam., 30 c.c.
 Tinct. gelsem., 2 c.c. M.
 Sig.—Teaspoonful hourly until relieved.—H.

Chloral in small doses is the author's favorite method for controlling the nervousness and discomfort of the earlier stages of scarlet fever, and may be given as follows:—

(32)

R. Chloral hydrat., 2-4 gm.
 Aquæ camph., 15 c.c.
 Syrup aur. cort., 45 c.c. M.
 To alternate with other remedies to quiet restlessness.

Others speak very highly of tinct. aconite given in first stage until its full effects are produced, *e. g.*, a drop every hour until its physiological effects are obtained. If malignant from the onset, prompt stimulation by the liberal use of wine and whiskey, and packing with wet sheets, wrung out of hot water and sprinkled with mustard, hold out the best prospects of relief. At the same time the throat should be carefully looked after, and sponged every two or three hours with undiluted peroxid of hydrogen, followed with the liberal use of the steam atomizer, whose cup contains gtt. v-xv, olei eucalypt., or better, Sander's eucalyptol. Even in

mild cases, the inunction of the skin at least twice daily with carbolated vaselin, or oleum theobromæ, adds much to the comfort of the patient, helps to limit the spread of the disease, and prevents chilling of the body.

Should the eruption be tardy in making its appearance, it may be hastened by the mustard pack, or rubbing the body with dry mustard or hot vinegar. Threatening cerebral symptoms during the prodromal stage justify the use of cold to the head, and the internal use of phenacetin and ergot with a purgative dose of calomel, followed by some mild saline. Failing strength, even when the fever is at its height, calls for quinin inunctions and the internal use of alcohol to its full physiological effects, for, as in diphtheria, there is a remarkable tolerance of alcohol, as 3ss or more of the best whiskey can be given every half hour, with no symptoms of intoxication and with marked relief to the patient. In similar conditions, the Germans generally advise camphor and musk in full doses.

During the entire course of the disease the urine ought to be examined daily—twice, if there are any suspicious symptoms—for albumin and casts, and scanty urine should be combated with the free use of lemonade, liquor ammonii acetatis, and if these fail minute doses of calomel (one-tenth grain every two hours) and caffeine. If, in spite of these, the symptoms of acute Bright's disease appear, with threatening anasarca, infusion of digitalis (3ss–3j p. r. n.) should be tried and the excretion from the skin encouraged by means of hot vapor baths, wet packs, or even jaborandi, provided its after depression be counteracted by the free use of some generous wine. Should these fail, relief must be obtained by means of purgation, unless diarrhea is already present. In uremic convulsions the inhalation of chloroform, hypodermics of morphin, or rectal injections of chloral and bromid (gr. v–x) will usually ward off a single attack, but will not prevent their return and usually a fatal termination. Milk diet must be insisted upon during kidney complications and iron and bitter tonics for general anemia.

Prognosis.—The degrees of implication of the cervical lymphatics furnish a valuable criterion as to the probable outcome of the attack. The mortality varies with the epidemic, varying from

3 to 33 per cent. According to Dudley, in 100 cases, albuminuria may be expected in 49, adenitis in 19, otitis in 10, acute nephritis in 8, diphtheria in 4, arthritis 3, mitral lesions 2, and pneumonia 1.

4. MORBILLI.

Synonyms.—Measles ; Masern ; rubeola.

Etiology.—Contagiousness very great, beginning with the prodromal stage ; by many supposed from microorganisms found in the nasal and pharyngeal mucus and urine, hence very easily carried in soiled linen and by third persons. Children under one-half year are exempt. Repetitions of the disease are not at all rare. See German measles for differentiation.

Symptoms and Progress.—After an incubation of 10–12 days appears the prodromal stage of three to five days. This is characterized by coryza, injection of the conjunctivæ, sometimes with photophobia, hoarseness, and a dry cough. Generally vigorous children do not wish to lie down ; while the feeble ones feel languid in consequence of their loss of appetite, and in such the evening fever may produce delirium. In the beginning of the prodromal stage there is an immediate rise of temperature ; but this sinks in one-half to one day to the normal, then increases again to 104°, with morning remissions, until the second stage (eruptive), which begins on the fifth day. The exanthema commences first on the face, on the cheeks or nose, and spreads thence in a day over the whole body, in the form of small, pea-sized, bright or bluish-red, round, irregular spots or patchy rash, which become more or less confluent, but there can always be found interspaces of normal cuticle between patches. The lymphatics are slightly swollen. In rare cases we find the summit of each spot crowned with a yellowish vesicle (*morbilli miliaria*), but usually the redness increases until the flushed spots become elevated a little above the sound skin. These may be distinguished from the papules of small-pox by stretching the skin, which causes the papule to become impalpable to touch in measles, but does not remove the shotty feel of the variola papule. Upon the completion of the eruption the fever reaches its highest point, and thereupon follows a critical decline (crisis), when all the symptoms diminish in severity. From

the third day the eruption begins to fade in the same order as it appeared, leaving in its stead a brownish hue, due to the deposition of pigment stain. The tumefaction of the skin diminishes, but the bronchial catarrh increases on account of a similar eruption on the bronchial mucous membrane. During the third, or the stage of desquamation, the epidermis is cast off in fine, mealy scales (similar to bran), and the general condition improves so rapidly that the children are now ready to walk about. The bronchitis occasionally persists for several weeks, and requires constant care from the physician. Measles may begin on the feet and legs or may exhibit any of the following variations:—

(a) Ecchymosis into the measly patches—*morbilli-hemorrhagici*—occasionally complicated with severe hemorrhages from the mucous membranes, or diphtheritic affections of the same, *e. g.*, of the conjunctiva, nose, pharynx, larynx, or vagina. Premature menstruation noted in many of these cases.

(b) Unusual implication of the mucous membranes, in the shape of excessive coryza, conjunctivitis, blepharitis, from the implication of the conjunctiva, or keratitis pustulosa with its complications. Hyperemia of the glottis may give rise to a continuous irritation, which produces a highly paroxysmal cough, resembling pertussis. Or the abundant secretion of the bronchial tubes may flow into the alveoli of the lung, and result in the lobular pneumonia, which is often found in the youngest children. The desquamation of the intestines sometimes leads to a diarrhea, simulating dysentery, and difficult to check.

Sequelæ.—(a) Chronic bronchitis, with bronchiectasis, lung atelectasis, and pneumonia, which frequently runs a chronic course, predisposing to miliary tuberculosis, caseous degeneration, and a rapidly fatal termination. (b) Whooping-cough often follows measles. (c) In scrofulous children, eczema of the face and hairy scalp, purulent inflammation of the middle ear, chronic otorrhea, or blepharitis, etc.; more rarely noma occurs.

Prophylaxis.—Perfect isolation is only necessary in those families where phthisis has already occurred, or where the children are suffering from bronchitis.

Treatment.—During the height of the fever cold drinks, as

lemonade, and a mildly diuretic expectorant mixture are desirable, *e. g.* :—

(33)

| | | | |
|----|-------------------------------|---------|----|
| R. | Liq. pot. citratis, | 30 c.c. | |
| | Syrupi ipecac., | 5 " | |
| | Tinct. opii camph., | 10 " | |
| | Succi limonis, | 15 " | |
| | Tinct. gelsem., | 2 " | M. |

Stg.—Teaspoonful in water every two hours, or as required.—H.

If headache annoys, cool cloths are to be applied to head and dilute hydrobromic acid substituted for the paregoric in the above mixture. Should further remedies be required, phenacetin (gr. ij-iv) will be found useful.

After the height of the disease has passed, for a couple of weeks great care should be taken to keep the child in a room with an even temperature, until the sensitiveness of the skin has disappeared and the bronchial catarrh is entirely recovered from.

Minute doses of morphin in cherry laurel water, and syrup of tolu, will be found helpful in cutting short the paroxysmal coughing which sometimes persists after an attack of measles.

When the cough is exceedingly persistent and caseation of the bronchial glands is feared, the child should be placed upon cod-liver oil, extract of malt, and syrup of the iodid of iron, and if possible taken to the country for a while.

Prognosis.—In well-to-do families the mortality ought not to reach more than 5 per cent., but among the very poor, or where the disease flourishes in a virgin soil, as in the Fiji Islands in 1875, the mortality is frightful—one-quarter of the entire population dying from the disease.

5. RUBELLA.

Synonyms.—German measles; Rötheln; bastard measles.

Etiology.—Undoubtedly due to a specific organism, not the same as that of either scarlet fever or measles, since previous attacks of either do not protect from rubella, which rarely occurs twice, except as a recrudescence.

Symptoms and Course.—After a period of incubation of about fourteen days, the prodromal stage begins, lasting a varia-

ble length of time, from two hours to as many days. It is, as a rule, without fever, or of a very moderate amount, shows swollen lymphatics of the neck, injected conjunctivæ and swollen lids, slight malaise, and mild catarrh of the air passages. This is followed by the eruptive stage (one-half to three days), during which the exanthema appears, sometimes with a lively fever of brief duration and sharp itching of the skin. The eruption occurs first on the face and neck and then over the entire body, extremely like an attack of measles, except that it is less circumscribed and more scarlet in color. With the eruption every trace of fever disappears, and in twenty-four to thirty-six hours the child's skin begins to regain its normal color. Slight desquamation may follow.

Differentiation is often difficult and can only be made from the entire course of the disease. Fever ordinarily disappears in twenty-four to thirty-six hours; later the exanthema begins to fade. The eruption of rubella is multiform, and it is claimed that it never arranges itself crescentically, as measles does. The enlargement of the post-cervical and auricular glands is claimed by some to be pathognomonic of the disease, but similar enlargements may be found in rubeola and in dentition.

Prognosis.—Good. There are no sequelæ.

Treatment.—Dusting with corn starch to allay the itching of the skin, and a dark room if the conjunctivitis is troublesome, are all that are usually required. Cool drinks may be allowed if craved by the child, or sponging if the temperature rises too high.

6. LA GRIPPE.

Synonyms.—Epidemic influenza; Russian influenza.

History.—Described some 250 years ago, but practically unknown in America until 1890, when a fearful epidemic swept over the country, with recrudescence in 1891 and 1892, and again mildly in 1895, killing and crippling more than the late Civil War.

Etiology.—Preeminently a contagious disease, spreading from person to person, not even nursing children being exempt. More than one form of microorganism has been found in the sputa of these cases, and undoubtedly some one of these is the contagium vivum of this disease, but of the modes of entrance into the body we

know little. The earlier cases of the epidemic are apt to be the most violent, the patient, especially if young, being overwhelmed with the virulence of the poison, as in the foudroyant forms of diphtheria or scarlet fever. Its period of incubation is apparently of very short duration.

Symptoms.—Invasion is rapid with young children, announcing itself by headache, earache, chill, or convulsions, and delirium and fever often high (105–107). The poison thus introduced may attack either the respiratory, the intestinal, or the nervous system. Bronchial catarrh is a frequent complication, threatening life by the violence of its onset and yet generally with a better prognosis than when the cerebro-spinal system bears the brunt of the attack. Cough is apt to be persistent and very annoying and syncopal attacks prone to occur. Depression of the heart's action, out of all proportion to physical symptoms, is one of the frequent and alarming symptoms, in many of these cases; or exhausting vomiting and diarrhea, simulating cholera morbus, may tax the skill of the physician, as will also the extreme irritability and fretfulness on the part of the child. As may be inferred from personal experience, headache and general muscular aching is as well-nigh intolerable to the child as it is to the adult. On the other hand, we find in some of these children a heaviness closely approaching coma, but even these resent the slightest touch or attempt to examine by the physician. The course of the disease with children is discouragingly slow, for while the acute symptoms subside within two weeks, sequelæ of indefinite duration remain.

Sequelæ.—Glandular enlargements and parotitis. Also abscess of the antrum and cellulitis, with or without metastatic abscesses. Chronic conjunctivitis and suppurative otitis are more frequent, and the latter may terminate in meningitis, especially if the child is of tubercular parents. Earle adds to this list rheumatism, chorea, nephritis, and periostitis, and Althus, neurasthenia, hypochondriasis, melancholia, and delirium.

Treatment.—Phenacetin and salicylate of soda stand at the head of remedies for the relief of the muscular pains of this disease, but they should never be pushed to subsequent prostration. Hot punches containing wine of coca are grateful in the early stages of influenza bronchitis, which should be treated from the

beginning with stimulating instead of depressing remedies. Opiates should be avoided as far as possible in the treatment of the intestinal catarrh, and bismuth, salol, and saccharated extract of coto used in their stead. Syrup hypophosphites, malt, and liquid peptonoids for retarded convalescence.

Prognosis.—Bad in the fulminating form, in others recovery may be expected, except in tubercular children.

Prophylaxis.—Influenza is a contagious disease and may be spread by handkerchiefs, clothes, and cuspidors, all of which should be disinfected after use by influenza patients.

7. PERTUSSIS.

Synonyms.—Whooping cough; tussis convulsiva.

Etiology.—Epidemic and very contagious, especially in the third stage, infection taking place through the breath and expectorations, and also through third persons or pieces in the wash, hence its spread through schools, children's homes, and hospitals. The contagion undoubtedly resides in a microbe carried from one person to another, probably the bacillus tussis convulsivæ, described by Afanassiew in 1887, who explains the characteristic symptoms as arising from the irritation of the superior laryngeal nerve by the toxines of this bacillus.

Symptoms and Progress.—After an incubation from 2-7 days, the first stage, of premonitory symptoms, occurs (*stadium incrementi*), which lasts from 1-3 weeks, and is characterized by a bronchial catarrh and a teasing, dry cough, with tickling in the throat and a slight evening rise of temperature. Very gradually this cough becomes convulsive, occurring in the paroxysms which attend the second stage of the disease (*stadium nervosum*). This is the only one which is diagnostic of pertussis, for in it occur the so-called spasms (3-50 in a day), which are occasioned by the attempts of the child to expectorate the mucus which gathers in the top of the windpipe. These paroxysms are of varying duration, according as the mucus which the child attempts to raise is tenacious or fluid, and whether the inspired air becomes carbonated or well oxygenated. Changes of temperature, sneezing, anger, joy, or laughing and violent movements of the body are all excit-

ing causes of these attacks, which may be rare or frequent, according to the intensity of the disease.

One of the paroxysms may be induced for diagnostic purposes by pressing with one finger the root of the tongue, until coughing occurs, ordinarily beginning with a series of short coughs quickly following each other, and succeeded by prolonged whistling inspiration, during which the child seeks for some support for its head, ordinarily by placing its elbows on a fixed object and holding the chin between its hands. During these paroxysms the face and hands grow livid, for these attacks are produced by a spasm of the glottis, which so narrows its chink that little air can reach the lungs, and what blood is circulating there fails to get its proper supply of oxygen. To counteract this, all the inspiratory muscles are put to their greatest activity. The stagnation of blood, resulting in congestion of the pulmonary artery, produces dilatation of the right heart and the entire venous system communicating with it, hence the cyanotic hue of the face, the ecchymoses of the eyeballs, and even hemorrhage from the eyes or ears or nose sometimes observed, and sometimes the straining is so great that the urine and feces are passed involuntarily. The paroxysms are terminated by the removal from the trachea of thick, glairy mucus either by vomiting or coughing, more frequently the former, during which hernia or prolapse of the rectum have been known to occur.

If the paroxysms in a day are limited in number and the vomiting infrequent, the general condition of the child may be but slightly, if at all, affected, except that the face becomes bloated, but if, on the other hand, the paroxysms increase in frequency, especially toward evening, in such cases the children lose strength rapidly, breathe with difficulty after each attack, and finally fall asleep from exhaustion. Lassitude, peevishness, and general anemia complicate these cases, and in very young children the paroxysms may produce convulsions and sudden death from suffocation.

On the other hand, satisfactory progress toward recovery is marked by the mucus becoming more fluid and coughed out with less difficulty. The third stage (*stadium decrementi*) cannot be sharply differentiated from the paroxysmal, which is gradually

merged into the third by decrease in the frequency of the attacks and the violence of the vomiting. The duration of this stage is very indefinite, owing to the liability of the child to relapses, and if enlargement of the bronchial glands has taken place, these relapses may be almost indefinitely repeated, but in general improvement is known by the absence of whistling inspiration, return of the natural color to the face, and the better tolerance of food by the stomach.

Pathology.—*Autopsies* in fatal cases give no other lesions for pertussis than those of its complications, unless it may be unusual irritation of the posterior wall of the larynx in the interarytenoid region, the so-called "cough region" of von Herff. All other lesions arise from deficient expectoration of the thick, glairy mucus, and its subsequent descent by gravity, with the production of catarrhal pneumonia and acquired atelectasis. This is most frequent in infants, from their custom of largely lying on their backs. The onset of such complication may be suspected in a child apparently improving, in whom sudden laborious breathing, working of the *alæ nasi*, appear, with fever and dry cough. In such cases death is alarmingly frequent, either from edema of the lungs or convulsions. When recovery can be hoped for, the *alæ* cease to dilate, and the cough again becomes characteristic of pertussis, but even then a chronic pneumonia or a partial caseous degeneration of the bronchial glands is apt to follow. Anemia, caused by too frequent vomiting and exhaustion, reveals itself in edema of the face and often of the remainder of the body. The most trivial of the complications attending pertussis are the small ulcers of the frenum produced by its friction against the lower incisors during the violent paroxysms of coughing, the so-called *whooping-cough ulcer*. These ulcers heal very easily, if the child can be induced to retract the tongue during the paroxysms of coughing. Gastro-duodenal catarrh, arising from swallowing masses of slime and too frequent vomiting, is one of the frequent and dangerous complications of pertussis, since its anorexia rapidly weakens the already debilitated child. Hyperemia of the brain, produced by straining during coughing, sometimes occasions capillary extravasation, violent pain in the head, vomiting, convulsions, and coma. Tubercular meningitis is also one of the

possible complications of pertussis, especially when there is accompanying caseous degeneration of the lymphatics. Pemphigus is one of the complications to be dreaded, as it betokens profound debility. Among the rarer sequelæ are dilatation of the bronchi, chronic pneumonia with caseous degeneration of the bronchial glands, secondary tuberculosis, hernia, prolapsus recti, emphysema, pleurisy, empyema, pneumothorax, edema of the glottis, and various cerebral palsies.

Prognosis in general is fair, although the mortality for earlier months of life is still very high, Dolan placing it third among the fatal diseases of children in England. In this country the mortality ranges from 3 to 15 per cent.; the younger the child the more unfavorable the prognosis. Death may occur in very young children from suffocation during an attack, though such accidents are rare. Convulsions are not unusual, though usually not as dangerous as might be expected. The mortality of the third stage is the highest, owing to the dangers of its many complications previously mentioned, also heart strain, too often overlooked. Glycosuria is a frequent complication, though not invariably so as once claimed.

Prophylaxis consists mainly in the removal of children, especially those predisposed to tuberculosis, from cities during an epidemic of pertussis, so long as the disease continues. Vaccination protects for a while from pertussis, hence all unvaccinated children should be vaccinated during the prevalence of an epidemic of whooping cough. Two months' isolation should be insisted upon; three, if necessary.

Treatment.—So large a number of specifics have been recommended for the cure of pertussis that the superiority of any of them may reasonably be doubted; the more so, since in one epidemic a remedy may appear of great value and yet fail dolefully when put to the test in the next. This seems to be especially true of the preparations of belladonna, which may be given either in the form of the powdered root, one-tenth to one-sixth of a grain twice or three times a day, until the pupil shows the characteristic dilatation produced by the drug, after which smaller doses should be given. The preparations of opium are also largely used to combat sleeplessness in appropriate doses. Carbonate of potash has some-

thing of a reputation as a solvent for the tough mucus, and may be profitably added to the expectorant mixtures ordinarily used during the second and third stages of the disease. Chloral hydrate in full doses is of real assistance in the second stage, for which others recommend morphin in minute doses. Bromoform in one-half to one-drop doses, suspended in syrup, has in a limited number of cases fully met the editor's expectations.

In the later stages tannate of quinin or alum is of value, as are also powdered Peruvian bark and the saccharated carbonate of iron, if the child can be induced to take them in full enough doses. A change of air also sometimes works wonders. Voluntary inhalation can scarcely be practiced by children under four years of age, but when this can be done the following formula will be found of use in a steam atomizer. The author much prefers a hand-bulb atomizer, from which the spray can be thrown directly into the nares and fauces of the child during the paroxysms, which are frequently cut short by this treatment. A two per cent. solution of carbolic acid or resorcin is well adapted for this purpose, though some prefer a saturated solution of ammonia bromid, *e.g.*:—

(34)

R. Sat. sol. ammon. bromid,

Cherry laurel water, aa f ʒij. M.

SIG.—For use in steam atomizer three or four times daily.

(35)

R. Antipyrin, 0.50

Syr. prun. virg., 20 c.c.

“ tolutan, 40 c.c.

Codein, p. r. n. M.

SIG.—Teaspoonful every two hours, for cough, will be found of advantage when the child is not debilitated from any cause.—M. P. H.

The vapor of cresolin or sulphur seem to modify the force of the disease but will not abort it, as claimed, and the same is true of the extravagant claims as to the value of quinin or resorcin insufflations. These should be blown directly into the pharynx, and, if possible, drawn into the larynx, but while they modify the violence of the paroxysms, they do not cut short the disease, and can

less conveniently be used than the sprays previously mentioned. Every effort should be made to diminish the number of attacks by means of the avoidance of their exciting causes, *e.g.*, running, calling, loud or angry talking, etc. Tickling the palate with a finger facilitates the removal of tenacious slime by vomiting when the child is found unable to expectorate it unaided. Should a child become comatose during an attack of coughing, it should be laid upon its back and cool compresses applied to its head. Diet should be as nourishing as possible, for a portion of the food is always lost by the vomiting which follows the paroxysms; hence milk, peptonoids, eggs, or other concentrated nourishment should be given immediately after the occurrence of the attacks, as often as required, and stimulating drinks and dry food, such as bread, potatoes, should be avoided. Pure air must be provided in as great abundance as possible, but unfortunately it is only in summer that children can spend much of their time out-of-doors, since chilling is most dangerous to such children, hence the course of pertussis is generally more tedious in the fall than in the early spring. The occurrence of fever during the progress of pertussis is always to be dreaded, as it usually betokens broncho-pneumonia. The usual remedies for tardy convalescence and bronchial adenitis should be employed when recovery is unreasonably delayed.

8. DIPHTHERITIS.

Synonyms.—Diphtheria; putrid sore throat; Bräune.

Definition.—Etymologically, diphtheria means simply a membrane, and hence may be properly applied to any form of croupous membrane upon the mucous membranes or any abraded spot upon the body. Careful study has proven that these membranes are produced by various causes, and hence they are conveniently divided into simple fibrinous, pseudo-diphtheritic, and true diphtheritic. In the present article the term diphtheria will be restricted to those membranes in which the Klebs-Loeffler bacillus may be found.

Etiology.—It seems to be fairly well established that diphtheria is primarily a local disease, due to a localized infection by the Klebs-Loeffler bacillus, either pure and simple or associated, as is more frequently the case with streptococci. This surface

diphtheria is of comparatively little importance until the reabsorption of its toxalbumins into the system takes place, for it is claimed that the Klebs-Loeffler bacilli never enter the blood nor are found in distant organs. (Dillon Brown.) Inoculation of animals with the toxalbumins of the Loeffler bacillus produces the sepsis, paralysis, and visceral changes so well known at autopsies. Hence we may expect to find two groups of symptoms in diphtheria, viz., those occasioned by the local diphtheritic growth and those due to the absorption of toxalbumin poisons produced by the diphtheritic membrane, which poisons, together with streptococci and other forms of bacteria, produce the dangerous complications of diphtheria which have become the scourge of all large cities. It is doubtful whether a perfectly sound mucous membrane will permit the growth upon it of the Loeffler bacillus, and it is certainly true that a catarrhal condition or abrasion of the oral membrane invites the presence and determines the locality of a diphtheritic membrane. Cold and dampness favor its growth and bad air is especially conducive to its rapid spread. The contagion of diphtheria is of short range but of persistent vitality, and may be communicated by the breath, third persons, infected clothing, rooms, and dwellings, in which the poison may persist for years.

Symptoms.—During the prevalence of diphtheria every sore throat should be regarded with suspicion, for we may have diphtheritic infection with so little membrane, or so located that it escapes our attention. Usually, however, after 12 to 48 hours' exposure difficulty in swallowing is first noticed, or the disease may manifest itself in the malignant form with a chill, succeeded by a sudden rise of temperature (103° – 104°). In milder cases the temperature rises quickly and drops to normal in four days, but in more malignant cases may continue high for weeks, the heart being dangerously irregular.

Diphtheria attacks, by preference, the back part of the mouth, appearing at first as a localized redness of the tonsils, palate, and uvula. At one or more points upon these appears either a curdy white or a grayish membrane. Thickened voice, difficulty in swallowing, and occasionally hoarseness also follow, while a very unfavorable symptom is the regurgitation of food, especially

liquids, through the nose, due to paralysis of the muscles of deglutition, from inflammatory swelling of the throat. Opening of the mouth is always difficult, but not uniformly so. The cervical lymphatics are often swollen ; often there is resulting stiffness of the neck. Similar symptoms with no visible membrane in the throat may be explained by membrane in the nasal cavities—an even more dangerous form of the disease—*coryza diphtheritica*, characterized by the escape of a copious, offensive, sanguinopurulent discharge from the nostrils, either one or both, bad odor to the breath, and signs of systemic poisoning.

Again, the membrane may spread downward into the larynx, giving rise to stenosis of the larynx, the so-called *diphtheritic croup*. If the membrane has been so slight or so located as to escape the attention of the physician, the diagnosis of this form of diphtheria from catarrhal laryngitis is by no means easy. The temperature chart is often helpful in this matter, for in laryngeal diphtheria the temperature is apt to keep high, 102° – 104° , as a rule, much higher than in catarrhal croup. In diphtheria of the larynx, after thirty-six hours of hoarseness or cough, the unmistakable marks of laryngeal stenosis appear, viz., labored breathing, aphonia, subclavicular depression of the thorax, cyanosis, or marble-like whiteness. These increase in intensity, and persist, either with or without slight intermissions, until the false membrane has been coughed out or the child dies from suffocation.

Differentiation.—The differential diagnosis of the various forms of false membranes found in the mouth is often clinically impossible, nor is it justifiable to pursue an expectant plan until bacteriological cultures confirm one's diagnosis. The initial lesions, even in serious cases, are often so light that valuable time may be lost waiting for the results of the initial culture (12–24 hours), which often requires second and third cultures to make certain the diagnosis. Hence Jacobi's rule to treat every membrane as if it might be true diphtheria is the only safe method. Of course, no means should be neglected to subsequently arrive at an accurate diagnosis. The Health Departments of many of our large cities furnish culture tubes in which to place bits of the suspicious membrane for differentiation by the city microscopists. For the removal of the membrane a pair of sterilized forceps or

a bit of freshly whittled wood should be used, and the membrane cleansed in two per cent. sterilized solution of boric acid before drawing it over the culture medium. The first growth of the colonies requires about twenty-four hours, and by an expert may be recognized by the naked eye, but microscopic recognition of the well known clubbed Klebs-Loeffler bacillus is the only absolute proof of the existence of true diphtheria. It should be remembered that the Loeffler bacillus may persist in the secretions of the mouth for a long time after the disappearance of the membrane, and that during all this time the child may communicate the disease. Faucial membranes in slight cases are shed in one to two days, leaving behind only the mucous membrane slightly thickened. In more severe cases the membranes are not cast off until the fifth or eighth day, and immediately re-form. They always leave behind them, on the mucous membranes, deeply ulcerated wounds, bleeding easily and cicatrizing very slowly. Or the process also locates itself on the mucous membrane of the cheeks, gums, nasal cavities, lacrymal duct, and conjunctiva, or works downward into the esophagus, larynx, or trachea, even into the finest bronchioles—*bronchitis diphtheritica*. Exanthemata, either scarlatiform or purpuric, are very frequent in diphtheria, and since the use of Heilserum their appearance has been laid to its use, but such eruptions were known long before antitoxin.

Complications.—Sudden death may occur from an overwhelming of the nervous system by the virulence of the toxalbumins produced in the fulminating form of the disease. Death from asphyxia may occur within twenty-four hours, in diphtheritic laryngitis, from an extension of the membrane into the bronchioles. Hemorrhage, following sloughing of the diphtheritic membranes, is another of the serious and often fatal complications of diphtheria. Albuminuria is by some claimed to be diagnostic of true diphtheria, and if not invariably so, it is extremely frequent, although Kormann thinks the existence of a nephritis with secondary edema complicating diphtheritis is proof positive of its being a case of scarlatina sine exanthema. Pneumonia is another of the dangers often dreaded, and arises either from an extension of the membrane downward, or more often from hypostatic infiltration of the lungs. Myocarditis and diarrhea are also

to be mentioned among possible complications, and cervical adenitis of varying degree is always present.

Diphtheritic paralysis may appear early in the disease, though as a rule it does not appear earlier than from one to five weeks. It is a true multiple, peripheral neuritis, closely resembling that following typhoid fever or from poisoning from mercury or lead. The lower limbs are those most frequently affected, although diphtheritic paralysis may affect the eyes, as partial amaurosis, hypermetropia, or as varying paralysis of the innervation of the muscles of the eye. The symptoms of diphtheritic paralysis generally begin in the soft palate and are shown by a snuffling voice, sometimes hardly intelligible, and loud snoring during sleep. A portion of the food, especially fluids, pass out through the nose. Examination shows the pillars of the fauces relaxed and the uvula apparently elongated and lying upon the back of the tongue. The paralysis next extends to the larynx. The voice becomes weak, hoarse, unreliable, and hollow, and the epiglottis closes only imperfectly, allowing a portion of the ingesta to enter. Such materials must be coughed out with difficulty, or if they have entered deeply, on account of the diminished sensibility of the larynx, severe bronchitis or pneumonia may result. The most dangerous complication is a simultaneous paralysis of the respiratory muscles. Paralysis of the extremities is usually preceded by a sensation of formication, then the movements of the hands or feet become uncertain and their sensibility greatly blunted. Then their use is lost in part or entirely, progressively from the part first affected, so that the head may fall forward or backward, and, in fact, every muscle in the body may become paretic. In such cases death occurs from paralysis of the heart.

A high degree of anemia always follows a severe case of diphtheria and this is one of the sequelæ to be carefully watched, even after apparent cure. Such children are pale, weak, and reveal a bellows murmur over the heart (anemic only), and in the worst cases the pupils are largely dilated, loss of consciousness is frequent, and sudden death may occur from heart failure after apparent convalescence.

Prognosis.—Not unfavorable if confined to the pharynx, tonsils, and nose, if properly treated. On the other hand, the mortal-

ity is very great in extensions of the disease to the larynx, and other complications—such as hemorrhage, anemia, pneumonia, etc.,—are greatly to be dreaded. Diphtheritic paralysis has generally a good prognosis, except in case of paralysis of the heart, which causes sudden death.

The Willard Hospital statistics show a mortality of $46\frac{1}{2}$ per cent. in true diphtheria without laryngeal complications; after intubation $71\frac{1}{2}$ per cent., but it should be remembered that there is no infallible guide for prognosis in diphtheria. It is one of the most dreaded and one of the most fatal diseases of childhood, and no one can predict from the beginning of any case what its termination will be.

Treatment (*Local*).—There is the widest possible difference in regard to the local treatment of diphtheria, but the writer has never found reason to regret early, frequent, and efficient local applications. Whatever views we may entertain in regard to the etiology of the disease, the presence of localized gangrene can but add to its dangers. The throat can at least be rendered aseptic by proper care, and this too often is entirely neglected or so inefficiently done that it practically amounts to nothing. The least painful and most efficient method of treating a diphtheritic throat is by means of swabbing it every two hours with reliable peroxid of hydrogen, diluted just before using with two parts of aquæ calcis. This does not stain or affect the sound tissues as do pyoktanin, carbolic acid, subsulphate of iron, or permanganate of potash, which so discolor the mucous membrane that we cannot judge of the progress of the diphtheritic membrane.

If now we follow with Hoadley's gargle or Loeffler's solution, we shall coat the throat with a resinous film which largely prevents the entrance of septic germs through the abraded surfaces. At least such is a reasonable explanation of the beneficial effect of these remedies when used conjointly, so long as the membrane reappears. In children old enough to gargle there will be no need for an atomizer, but in those unable to do so, the Hoadley mixture should be used through a hand-bulb atomizer, at intervals not greater than three-quarters of an hour, day and night. Others advise local applications of lime-water, pancreatin, papayotin, lactic acid, etc., for the purpose of dissolving the membrane, or

use the electro-cautery. Vaginal diphtheria may be treated by scraping off the membrane wherever found, and applying stick nitrate of silver to the surface beneath, or packing with iodoform gauze.

Modified Hoadley's Gargle.

℞. Tinct. myrrh, ʒ iij
 Listerine, ʒ j
 Mel despumat., ʒ iv
 Sat. sol. potass. chlorat., ʒ iij.

SIG.—Use every thirty minutes. (*H.*)

Medicinal.—In threatening laryngeal complications the author has more confidence in the following than in all other internal medications, the same to be pushed until the stomach or bowels rebel.

℞. Hyd. chlor. corros., gr. j
 Am. chlorid, ʒ j
 Spir. frumenti, f ʒ iv.

SIG.—Teaspoonful in water every hour. (*M. P. H.*)

In the same danger others recommend highly calomel sublimations, 15 to 30 grains being used every 2–4 hours. The child should be rolled in blankets, so that only its face is exposed and then held near a steam atomizer in which a tin pan should be substituted for its usual boiler. On this pan the calomel is sprinkled and the alcohol lamp placed beneath until the sublimation is complete. Salivation is rarely produced in the child, though not infrequently in the attendants, and the coughing caused by these vapors is often annoying, but the treatment is undoubtedly of great value where it can be efficiently administered.

Fresh air and regular feeding with nutritious food, of which good milk and eggs are the best, are fully as necessary as medication, for without these medication will fail in a long fight as certainly as an army without supplies. Antitoxin, at the time of writing, appears to be a valuable adjuvant to the treatment of diphtheria, but it should be remembered that its only just claim is that it antidotes the toxalbumins produced by the growth of the Klebs-Loeffler bacillus. By its use in the Berlin hospitals, the mortality in the diphtheria wards has been reduced from 33 to 13

per cent. It is the blood serum from an immunized horse, and is used by hypodermic injection, preferably in the back, and in the author's hands has more than met its claims, if used early. It does not protect, as does vaccination, against subsequent attacks, nor will it cure diphtheritic nephritis, paralysis, or later complications of diphtheria.

A résumé of this scope is not the place for the discussion of the rival claims of incubation versus tracheotomy, for the relief of diphtheritic stenosis of the larynx. The first has proved so uniformly unsuccessful in the practice of the writer, that he naturally prefers the operation after which some of his patients have survived, but he is entirely willing to admit that others obtain most excellent results from intubation, which is an operation to which consent may often be obtained when obstinately refused for tracheotomy.

It should always be borne in mind that the safety of your patient is not assured by the disappearance of the membrane from the throat, for a goodly proportion of diphtheritic patients die either from nephritis or heart paralysis during apparent convalescence. Hence the urine should be carefully examined for at least two weeks after the throat is clear and a recumbent position insisted upon for the same length of time. Diphtheritic paralysis is often very slow in recovery, but it may confidently be expected to yield to the continued use of strychnia, massage, and electricity.

Trouble in swallowing may be minimized by feeding with cubes of bread dipped in soup, milk, or beef juice, when swallowing liquids causes coughing. Iron and fresh air are our best remedies for post-diphtheritic anemia.

Prophylaxis.—During an epidemic of diphtheria daily inspection of throats at school and in the family should be insisted upon, and upon the first appearance of congestion the Hoadley gargle, or a weak solution of bichlorid (1 : 5000) used as required. A diphtheritic patient should be isolated as carefully as one suffering from scarlet fever, and equal care taken to disinfect the room before its use by others. Indiscriminate kissing of children is always silly and often dangerous, unfortunately not to the kisser. No operation should be done upon the throat or nose when diphtheria is prevalent, at which time every case of sore throat should be

regarded with suspicion, for a case of diphtheria, too mild to be of much annoyance to its possessor, may communicate a virulent attack to one less immune (Jacobi).

9. PAROTITIS EPIDEMICA.

Synonyms.—Mumps; Ziegenpeter.

Etiology.—Capitan describes pathogenic microbes found in the blood and saliva of persons suffering from epidemic parotitis. Believed to be carried chiefly by respiration, and is most prevalent in damp and cold weather.

Symptoms.—After an incubation of about fourteen days premonitory symptoms occur. These are chill, with increased temperature, lassitude and loss of appetite; but only in very irritable children convulsions and delirium. In two or three days pain is felt in the region of the ear, and is increased by opening the mouth or swallowing. There is swelling about the parotid without redness, and if the submaxillary lymphatic glands swell at the same time, not only the region of the ear and cheeks, but also the side of the neck, is greatly enlarged, while the subcutaneous cellular tissue on that side may become edematous up to the ear, and pits on pressure. Opening the mouth is hardly possible, speech is indistinct, and the head bent to one side. Very rarely the other parotid is affected a few days later, in a like manner, the height of the inflammation falling from the second to the fifth day, the disease terminating, as a rule, by resolution in about a week. Occasionally the inflammation proceeds to suppuration, and discharges externally into the external auditory meatus or into the middle ear (difficulty of hearing and deafness from perforation of the membrane of the drum). The well-known simultaneous inflammations of the testicles and ovaries in adults is not often observed in children. The possible complications are brain symptoms, in consequence of the disturbance of circulation, temporary facial paralysis, from the pressure of the inflamed and swollen gland, which may also remain permanently indurated after suppuration.

Prognosis.—Very good, unless septic parotitis is mistaken for the epidemic form.

Treatment.—Warmth over the parotid region. If there is great swelling or cerebral symptoms use leeches or scarification

and phenacetin or Dover's powders as required, and when there is induration, iodine or cod-liver oil. When suppuration is imminent, employ poultices, of which muriatic ammonia and aconite leaves (3ss-℥j) make one of the best. When pus forms the cavity should be opened and treated antiseptically.

Prophylaxis.—Rendu believes that the time of greatest contagion is at the end of the stage of incubation, or just before the appearance of the parotid swelling. If this is true, quarantine is practically useless, unless the time of exposure can be accurately fixed.

10. TUBERCULOSIS.

Etiology.—The contagiousness of tuberculosis still being under dispute; a brief discussion of the disease may here serve as a connecting link between the acute contagious and the endemic infectious diseases of childhood. According to Ratchford, hereditary tuberculosis is the most prolific source of anemia in childhood, which may be confidently expected whenever tuberculation of the lymphatics occur, and, vice versa: "pronounced anemia without apparent cause is strongly suggestive of concealed tuberculosis." It should be remembered that the bacillus tuberculosis is not directly transmitted from mother to child, but only a transmitted predisposition to tubercular growths in the tissues of the child, which predisposition is readily excited into activity by cold, poor food, or dwelling in damp or dusty dwellings, especially those housing other tubercular patients, whose dried sputa preserve their virulence for a long time.

Unresolved pneumonia, or chronic suppuration, should always be just ground for anxiety, since caseous emboli from these may at any time be carried by the circulation and deposited elsewhere in the body to act as foci for tubercular degeneration, as has been repeatedly proved by the introduction into the circulation of the lower animals of bits of rubber or other foreign materials. Hence it is that acute miliary tuberculosis not infrequently rapidly supervenes upon measles, or follows caseation of the cervical, bronchial, or peritoneal lymphatics.

Pathological Anatomy.—Same in the child as in the adult.

Symptoms.—May reasonably suspect latent tuberculosis in child with extreme paleness of face, bluish sclerotics, progressive

emaciation, cold extremities, and afternoon rise of temperature. The spinal symptoms of tubercular meningitis and tabes mesenterica, can be found under their appropriate heads.

As in the adult, tuberculosis may take the form of (*a*) acute miliary tuberculosis, or (*b*) subacute infectious tuberculosis, or (*c*) chronic tuberculosis, either general or more frequently localized, differing in no essential respect from the same modifications as found in the adult.

Prognosis is always bad, especially after the appearance of coolness of the extremities and nose, edema of the joints, and thrush. An increase in the weight of the body makes the prognosis somewhat better, at least for the present. Meningeal tuberculosis almost always ends fatally within a short time, and even when there is an apparent cure there always remains a tendency to a relapse.

Tuberculosis in children is more apt to run a rapid course with an early fatal termination, than with the adult, but every supposed case of tuberculosis does not necessarily have a fatal termination.

Prophylaxis.—In phthisical or tuberculous families, the children ought always to have a healthy wet-nurse, and later, scrofulosis is to be guarded against by means of nutritious diet, good air, and cold bathing. If scrofulosis has already broken out, especially where the lymphatic glands are already caseous, it must be treated in the most energetic manner possible. In such families, all bronchial catarrhs, pleurisy, or hemoptysis, especially after measles and whooping cough, as well as otorrheas (caries of the temporal bone), and suppuration of the bones are to be dreaded.

Treatment is mainly dietetic and hygienic, and consists of the most nourishing food, eggs, cream, raw beef, butter, and the best of air, cool and dry, in which to daily practice forced inspiration, under the doctor's directions. The Adirondacks, Upper Michigan, and Colorado have a well deserved reputation for the relief of incipient phthisis. Tuberculosis of the bones demands early and radical surgical treatment, with hopeful results possible. Cod-liver oil is the most reliable of all internal remedies, but only the oil that is assimilated is of any value.

SECTION VI.

ENDEMIC INFECTIOUS DISEASES OF CHILDHOOD.

I. TYPHOID FEVER.

Synonyms.—Enteric fever, infantile remittent; Nervenfieber.

Etiology.—Differs in no wise in its origin from the typhoid fever of adults, though its symptoms are so much milder in the very young that its occurrence before two years is strenuously denied by many writers, and Northrup still insists that engorgement of Peyer's patches, considered diagnostic of typhoid, cannot be so considered in autopsies made upon young children.

Symptoms are often so mild in children as to escape notice except perhaps the headache, lassitude, and afternoon rise of temperature. Prodroma absent in young children or unnoticed, and diarrhea generally moderate in degree and not typical in appearance. Tongue often heavily coated and rose spots generally present as in the adult. Temperature ranges from 101° – 103° with bronchial symptoms exceedingly frequent in children, as a rule, replacing the abdominal type of typhoid of the adult, and it should be remembered that the temperature curves may be very irregular.

Differentiation is often difficult and sometimes impossible in the earlier days of the disease, which closely simulate the onset of tuberculosis, or meningitis. Hepatic incompetence gives us a similar train of symptoms, hence, the differentiation must be made from the temperature record and the presence of the following cardinal symptoms of typhoid in the child, viz. ; Headache or apathy, persistent fever with evening exacerbation, and rose spots. Bowels often constipated, and bronchitis generally present.

Treatment.—Largely expectant and dietetic, for the writer believes that these cases need but little medication except the free use of lithia water, cool sponging and a milk or koumiss diet. Whenever the temperature reaches 103° a cold bath or sponging should be preferred to the ordinary antipyretics, although phena-

cerin is permissible to relieve headache. Good ventilation is a *sine qua non* for satisfactory treatment of these cases and the immediate disinfection of all dejecta and chamber vessels should be insisted upon. If diarrhea is present salol and bismuth, or the salicylate of bismuth are usually sufficient to confine the passages to two a day, less than which it is not desirable to restrict them to. Up to the end of the third week the diet should be exclusively liquid, consisting largely of milk, barley, or chicken broth, etc., without eggs. Relapses are easily produced in the child by errors of diet or overfeeding, and very apt to occur with the returning and voracious appetite of the convalescent child.

Prognosis.—Generally better than with the adult, especially if the child can receive the care and nursing of a good hospital where the mortality ought to be as low as five per cent.

Complications.—As the typhoid of children is generally milder than that of adults, its complications, as might be expected, are generally lighter and less dangerous. Hypostatic congestion of the lungs is the one most frequently met with and needs most watchfulness on the part of the physician. Parotitis, pleurisy, and peritonitis are also possible complications, but like intestinal hemorrhage are comparatively infrequent in the child. The same may be said of laryngitis, cellulitis, and other forms of post-typhoid sepsis noted by various authors.

2. CEREBRO-SPINAL MENINGITIS.

Synonyms.—Epidemic spinal meningitis; spotted fever.

Etiology.—Undoubtedly due to a specific infection, which is often spread by massing large bodies of men, as in army barracks and prisons. The majority of those attacked are children, and of these fewer males than females. The disease, pathologically, is a purulent or a puro-gelatinous inflammation of the pia mater and arachnoid of the brain and spinal cord. Very frequently small points of suppuration, extravasations or (embolic) softening are found in the substance of the brain.

Symptoms.—The disease begins without a definite stage of incubation, and generally without premonitory symptoms, but with immediate frightful vomiting, shivering (106°) and convulsions in little children, or pains in the back, head, and limbs, until con-

sciousness disappears. If this occurs at the very beginning of the attack (the so-called fulminating cases), the pains are wanting, and in such cases generally a fatal termination rapidly occurs. The cervical and dorsal vertebræ are sensitive to pressure, and sometimes this is true of the whole spine, from the head downward. At the same time there is great hyperesthesia of the skin, the limbs soon become partly paralyzed. The muscles are often tetanically contracted, bending backward the cervical portion of the spinal cord—*opisthotonos*—and when the tetanus or clonic spasms increase there is often loss of consciousness. The pupils are often dilated, but changeable. The chills repeat themselves, and the temperature, with slight intermissions, continues high. The tongue is dry, and at first the bowels are constipated, later diarrhea, and sometimes albuminuria, occur. The skin is hot and dry by turns, or exceedingly moist, and occasionally showing roseola or petechiæ, and frequently on the fourth day a herpetic eruption on the face. The spleen is often moderately enlarged, and all these symptoms make it very easy in the beginning to confound this disease with typhus, tubercular meningitis, or an acute exanthema. Imperfect reabsorption of a meningeal exudation may produce permanent disturbance of sight, hearing, or lead to a partial paralysis of the lower extremities. Absorption of pus leads to pyemia, heralded by a chill. The duration of the disease may be from a few hours to several months, due to complications, such as acute fatty degeneration of the liver and kidneys, endocarditis, purulent inflammation of the joints, parotitis, pneumonia, chronic hydrocephalus, suppurative inflammation of the dorsal muscles, etc.

Prognosis.—On an average forty per cent. die; the majority from meningitis; a few from secondary disturbances, and some even later, from chronic hydrocephalus. Death may occur either in a few days or after a duration of several weeks.

Prophylaxis.—Prompt removal of children from the infected places—barracks, orphan asylums, etc.; avoidance of sudden changes of temperature, or undue exertion; and regular mode of living.

Treatment.—(1) Try to diminish inflammation by leeches on the head, cupping along the spine, and cold applications or ice

bladders to the head and spinal cord ; (2) lessen the fever by cool baths and colder affusions ; (3) removal of the constipation by calomel or vinegar enemata ; (4) subcutaneous injections of morphin for the pain ; (5) wine, iron, etc., for exhaustion, and (6) iodid of potash for the absorption of the exudation, if the child survives.

3. INTERMITTENT FEVER.

Synonyms.—Malarial fever ; chills and fever.

Etiology.—No age is exempt from intermittent fever ; even the fetus in utero can be infected from a malarious mother, or by the milk from a nurse suffering from intermittent fever, whose cause is now generally admitted to be specific microorganisms introduced into the blood. Their growth produces such changes as to cause autointoxication, which causes the chill and the reaction from this the fever and salutary sweating which follows. As might be supposed a child's organism is more easily affected than an adult's, and one attack predisposes to others. The infection takes place by means of contaminated drinking water, or the breathing of air which contains specific microorganisms, and consequently the disease is confined to certain districts, especially swamps, overflowed lands, etc., where these definite organisms are produced. By deepening the rivers, preventing their frequent overflow, and cultivation of the country, the disease can be made to disappear, as has been done largely in the older parts of the country.

Symptoms and Progress.—In children above two years the disease generally runs the same course as with adults, but with younger the course of intermittent fever is different. In these latter the stage of incubation is as indefinite as usual, lasting from a few hours up to several weeks, and the attacks are generally quotidian but without being confined to any definite point of time. Tertian and quartans are rarer, and abortive attacks are common. The chilly stage is usually replaced by repeated convulsions (one quarter to one hour) with coma, small pulse, coldness of the skin, livid extremities. During the attack the temperature often reaches 105° F. (40.5° C.), the pulse becomes full and strong, producing great excitement and restlessness, and a flushed appearance, for two to four hours, after which very frequently we have none or

only very slight perspiration. The enlargement of the spleen is greater than in the adult, and can only be confounded with lardaceous degeneration, syphilitic gummata, or leukemia. In children the malarial cachexia also appears as early as the first or second week, producing anemia, weakness, loss of appetite, emaciation, and hence frequently mistaken for tuberculosis, or caseous degeneration of the glands, etc. In addition there may be tumefaction of the liver, diarrhea, and edema; with a high degree of cachexia, dark brown pigments appear in the blood (*melanemia*), and malarial neuralgias—especially of the trigeminus—are not at all infrequent.

Prognosis.—Not entirely favorable for children under two years, especially in those localities where the fever appears in a malignant form.

Differentiation.—It should always be remembered that gastric disturbances, nausea, anorexia, and epigastric distress with young children, often replace the chill; with others a daily convulsion may be substituted for the cold stage, and the fever is more persistent, and less apt to terminate with the typical sweating stage. Again an abdominal neuralgia closely resembling colic may appear nightly, and resist all ordinary treatment until its malarial origin is recognized. Enlarged spleen is considered, by some, as absolutely diagnostic of malarial poisoning. (Vining.)

Treatment.—As with the adult, the cinchona preparations are our most reliable remedies. The dose should be regulated in accordance with the age of the child, and should, if possible, be so administered that the full amount should be given at least two hours before the expected paroxysm. When the obstinacy of the child prevents this, quinin inunctions (℞j to ℥j lanolin) should be resorted to, unless your little patient can be beguiled into taking quinin tannate in the agreeable chocolate lozenges in which it can be obtained. A single large dose of quinin, preferably the bisulphate may be given in rectal suppositories, but this method is not adapted for continued use. If possible, the child should be removed from the malarious district, but when this cannot be done, it should be kept on small doses of arsenic, Fowler's solution, to prevent the occurrence of malarial anemia, and the splenic complications so frequent after chronic malaria.

(13)

R. Quin. sulph., 1 gm.
 Am. glycyrrhizin, 2 "
 Simple syrup, 60 c.c. M.

SIG.—Teaspoonful every hour until the desired dose has been taken.

—CURTIS.

Prophylaxis.—Removal, if possible, from swampy or low-lying districts, and, if this is impossible, avoid exposure during the early morning and evening hours, and the use of boiled water only.

4. EPIDEMIC COLITIS.

Definition.—An acute inflammation of the mucous membrane of the colon, possibly diphtheritic in character, and frequently epidemic at the same time with diphtheria, or intermittent fever.

Etiology.—Occurs chiefly during, or after a very hot summer or in tropical localities, but rare in children under one year; after that, until the fifth year, quite frequent.

Symptoms.—After an incubation of a week or ten days, with or without a chill, diarrhea makes its appearance, and shortly increases greatly in frequency, often to twenty or thirty motions a day, and is accompanied with great straining at the anus, tenesmus, tingling in the limbs, with griping pains in the abdomen, which becomes painful to pressure. At first small quantities of fecal matter may be present in the stools; but the succeeding discharges become glairy, consisting of pure mucus—the so-called white of an egg passage. Sometimes they are uniformly and sometimes partially colored red, from hemorrhage of the colon, constituting the true bloody dysentery. The stools have a mawkish, sourish smell, and differ in appearance according to the degree of the hemorrhage and the distance of the bleeding place from the anus. If a diphtheritic destruction of the epithelium of the mucous membrane has taken place, then the dejections have a carrion-like odor, and are mixed with shreds of mucous membrane. The stools are often of a dingy or reddish-gray color, and contain considerable pus from the ulcers resulting from the casting off of the diphtheritic membrane. In such cases the attempt to give an

enema is always difficult and may occasion convulsions. In the beginning there is either no elevation of temperature or very little, and in severe cases there is a fall; but when there is ulceration, the temperature is always increased, attended at times with delirium and convulsions.

Prognosis.—After four to six days, in the sporadic cases without diphtheritic membrane, and after ten to fourteen days in epidemics, the stools again resume their fecal odor and appearance. The mucus and pus, as well as the tenesmus, gradually become less, the appetite improves, and emaciation ceases, unless diphtheritic ulcers have formed. Emaciation then is marked, the fever higher than before, and violent abdominal pains and vomiting often precede peritonitis, with or without intestinal perforation. Frequently the disease ends in a chronic dysentery, by which is meant a chronic ulceration of a part of the intestine, which may finally heal, with great cicatricial contraction, and sometimes, as might be expected, with stenosis of the intestine. Cessation of tenesmus is not always to be regarded as a favorable symptom, since it may be due to a paralysis of the sphincter.

Death often occurs in these cases, but more frequently it arises from the sequelæ of dysentery. These are caseous degeneration of the mesenteric glands (*tabes mesenterica*), pyemia, abscess of the liver, with icterus, marasmus, anemia, and prolapse of the rectum, from tenesmus.

Treatment.—1. All fecal accumulations are immediately to be removed by gr. ss of calomel, repeated every three hours. Opium is then the best remedy, and, if possible, should be given by the physician himself, in enemata of a thin, lukewarm solution of starch, containing a number of drops of laudanum, equal in number to the years of the child, or chloral hydrate may be substituted for the laudanum.

2. All drinks should be lukewarm and mucilaginous. Cow's milk, unless sterilized, is to be avoided, and children at the breast are not to be weaned, but barley water or white of egg in sterilized water is to be given for thirst, which is often excessive.

3. Tannate of quinin and salol are among our most reliable remedies in the latter stages of the epidemic variety, where great care should always be given to the disinfection of the stools.

SECTION VII.

DISEASES OF THE NERVOUS SYSTEM.

(A.) THE BRAIN AND ITS MEMBRANES.

1. ENCEPHALOCELE.

Synonyms.—Meningocele seu hydroencephalocele.

Differentiation.—A fluctuating tumor, from the size of a hazelnut to a child's head, generally found on the occiput, more rarely at the top of the nose, or at the greater fontanelle. Around the periphery of the tumor a circular opening can be felt beneath the tense and thinned integument, unless this has ruptured during birth. Within the tumor cerebral substance can be felt, either with or without fluid. Compression reduces the size of the tumor, but causes pain and sometimes convulsions.

Prognosis.—When life is preserved, chronic meningitis usually follows with a fatal result in after years; and even if recovery ensues, the intellectual faculties remain defective.

Treatment.—Attempts at replacement usually fail, especially when there is a large collection of fluid in the sac. Tapping, in such cases, sometimes produces relief, but is very apt to cause convulsions. When successful, it must be frequently repeated, and small amounts drawn off each time. Failing in this, compresses, or a perforated metal plate, should be worn over the tumor.

2. ACEPHALIC MONSTROSITIES.

Headless monsters—*acephalia*—completely deficient of brain except the medulla oblongata, have been born, generally with other malformations or imperfectly developed elsewhere. They may be born alive, but are always non-viable. Partial deficiencies in the brain, especially of the larger hemispheres or the smaller parts of the brain, are sometimes found associated with a defective formation of the bones of the head or face—*hemicephalia*. *Micro-*

cephali possess abnormally small skulls, whose sutures are often strongly united at birth, giving them a hideous appearance. The forehead is absent, the arch of the skull is flattened, and the nose, from its relatively large size, projects well forward, like the bill of a parrot. Viable, but generally, though not always, imbecile. And, finally, a less marked degree of microcephalia is acquired by a premature ossification of the sutures of the skull after birth. These unfortunate, because half-imbecile children, may attain a great age, though deficient in intellect and speechless if their cranial capacity is less than 28 c.c. *Monophthalmi* are hideous monsters, possessing only one eye, with arrested development of one-half of the face and cerebrum.

3. HYDROCEPHALUS.

Synonyms.—Water on the brain ; Wasserkopf.

Definition.—In its widest sense, hydrocephalus embraces all accumulations of serous fluid within the cavity of the skull.

Varieties.—Internal or ventricular, or external (arachnoidean), edematous, etc., or congenital, acquired, symptomatic. Simple hydrocephalus is usually defined as that unattended with malformation of the brain. Scaphocephalus is the name applied to hydrocephalus limited to the lateral ventricles.

Frequency.—Of 200 cases, Steiner found 100 internal, 80 edema of the pia mater, 10 external (between arachnoid and dura), and 10 were simple cerebral edema.

Etiology.—Either congenital or acquired, the first usually internal, and, according to Meigs, arising from inflammation of the membranes lining the ventricles, similar to that of the peritoneum which produces ascites. May also be due to tumors at the base of the brain. Hydrocephalus is not infrequently due to syphilis, in which form the characteristic symptoms appear earlier than from other causes, insomuch so that a syphilitic origin may be justly suspected in all cases existing earlier than 3½ months.

Pathology.—Hydrocephalus being strictly speaking a symptom and not a disease per se, the autopsy should reveal the lesion which produces the cerebral effusion. This may be due to tubercular deposits in the pia (see *Tubercular Meningitis*, page 122), or

to tumors located within or at the base of the brain, or any cause which produces thickening of the ventricular walls (syphilis, chronic inflammation, etc.). This causes an excess of interventricular fluids, finally shown by distention of the scalp, while the bones are thinned or actually wanting in spots, where only membrane can be found, especially toward the occiput (craniotabes). On opening the skull the enlarged brain protrudes *en masse*, with flattened convolutions and leveled sulci and gyri. The walls of the distended ventricles are greatly thinned by stretching, very easily torn, and sometimes actually perforated—Steiner once having seen the foramen of Monro distended sufficiently to pass an egg—optic thalami and corpus striata flattened, the crura separated, and cerebellum crowded up against the bones. The brain structure is lardaceous and dense with white, fat-like spots. (Lamb.) Fluid varies from four ounces to six pounds.

Symptoms.—Congenital hydrocephalus produces dystocia, and if sufficiently great may require puncture to permit birth. If less in degree the child may live and show all the characteristic malformations of hydrocephalus.

Acquired hydrocephalus usually begins with symptoms strongly resembling those of tubercular meningitis, viz., crying, vomiting, headache, fever, possibly delirium, and partial paralysis, especially of sight, the pupils becoming dilated and fixed, or nystagmic, with best vision in the bright sunlight. Hearing is generally unaffected and pulse and respiration unchanged. Appetite often voracious and capricious, though digestion remains normal. Acquired hydrocephalus never produces the very great deformity of the congenital variety, because the sutures become more or less ossified, but the head is elongated antero-posteriorly, and if the fontanelles have not closed they project outward, and often pulsate with each cardiac impulse. Congenital hydrocephalus often produces the most hideous deformities by its unarrested progress, the temporal bones becoming so oblique that the tips of the ears can no longer be seen from above. The forehead, likewise, bulges forward, the orbits become shallow, and the eyes project forward and look downward, or become strabismic, and the attempt to establish collateral circulation enlarges and makes turgid the veins of the forehead and scalp.

Prognosis.—Life may be long preserved, and the child even reach maturity, if the amount of effusion is small, and no intercurrent disease complicates; for the majority of deaths take place not directly from hydrocephalus, but from subsequent bronchitis, pneumonia, or the exanthemata. Coma, convulsions, exhaustion, and pyemia also occasion a number of fatal cases.

Treatment, as yet, is very unsatisfactory, although compression, venesection, and a vast number of drugs have been tried. The general health of the child is to be preserved, its diet regulated, and intercurrent disease carefully watched. Tonics and mild diuretics are theoretically indicated, but yield very unsatisfactory results. Tapping has been successfully resorted to by Keen, and craniotomy with puncture into the subarachnoid space, without permanent drainage, has been favorable reported upon by others. In syphilitic hydrocephalus potassium iodid holds out the best hope of success.

4. HYPERTROPHIA CEREBRI.

Varieties.—Either congenital or acquired, general or partial.

Etiology.—Both rickets and scrofula predispose. The skull is unduly large and prematurely ossified in the congenital form; the acquired form can be diagnosed from hydrocephalus only before the closure of the fontanelles, and by the absence of the characteristic deformities of hydrocephalus.

Symptoms.—Intellect varies from fairly good to imbecility; especially in later stages, from occurrence of “cretinism.”

5. HYPERTROPHY AND SCLEROSIS OF BRAIN.

Occurrence.—Fortunately rare in America.

Pathological Anatomy.—Increase in connecting nucleated substance—neuroglia—the brain becoming hardened like cartilage, with subsequent atrophy.

Differential Diagnosis.—Enlargement, chiefly over ears; eyes not strabismic. Often very difficult to distinguish from hydrocephalus or meningitis.

Etiology.—Rickets, congested brain, bad dwellings, and poor air, lead poisoning, etc.

Symptoms.—Complicated, sooner or later, with convulsions, paralysis, blindness, or neuralgia.

Duration.—Very uncertain, and prognosis always bad.

Treatment can only be symptomatic.

6. ATROPHIA CEREBRI.

Etiology.—Always secondary and associated with some other disease, such as general atrophy subsequent to cholera infantum, or thrombosis of the cerebral sinuses, etc.

Symptoms are those of cerebral anemia (which see), viz., depression of the anterior fontanelle, overriding of the cranial bones, threatening collapse, etc.

Prognosis.—If due to simple inanition it is fairly hopeful; from all other causes very bad.

Treatment.—See *Cerebral Anemia*.

7. IDIOCY AND RETARDED MENTAL DEVELOPMENT.

Occurrence.—By no means infrequent with children.

Etiology.—Arises either from—

(a) Arrest of growth (microcephalics);

(b) Arrested development, *e. g.*, feeble-minded; or

(c) Disease, *e. g.*, hydrocephalus, sclerosis, etc.

Varieties.—(a) Transient, as post-typhoid, measles, choreic, or (b) Congenital, (c) Acquired; generally associated with some bodily defect, such as deafness, eclampsia, heart disease, etc. Differentiation is not always easy, but as helpful toward this, it should be remembered that in the normal development of children, a child follows light after two weeks (smiles about same time). Natural squint for one month; later, abnormal. Holds objects in hands at three months; knows faces by three to four months. Holds up head about three months, and always keeps tongue in mouth, if bright. Recognizes names at eight to nine months; able to stand on feet at nine months; talks from nine to sixteen months. Anterior fontanelle should close at same time when child is able to walk (about eighteen months). Any marked variation from these data constitutes backwardness, of all degrees from this to absolute idiocy.

Treatment.—The only satisfactory treatment of these cases is that by specially-trained teachers in public institutions, or in private schools for the weak and feeble-minded, which accomplish wonders, even in very unpromising cases. In cases of arrested growth surgery has attempted a cure by means of craniectomy. Operation justifiable, but results as yet not brilliant.

8. ANEMIA CEREBRI.

Synonym.—Hydrocephaloid irritation of the brain.

Etiology.—Clinically convenient to discuss at this point, although it is really a symptom, or sequela, of any disease in childhood which leads to a high degree of emaciation, or great depletion of the fluids of the body (cholera infantum, chronic diarrhea, hemorrhage, etc.).

Symptoms.—Restless boring of the occiput into pillows; incessant movements of the head to and fro, hence baldness of the occiput; clutching at the head and scratching of the face. The eyeballs are rolled upwards and not unfrequently there are rigid flections of the upper and lower extremities—thumb in fist, etc. There is also stiffness of the neck, which may escape attention until the child is placed in the sitting posture. These children often moan pitifully and incessantly until they become too feeble to do so any longer. The typical pulse and respiration of tubercular meningitis will serve to differentiate between the two diseases.

Prognosis.—Bad, but not necessarily hopeless.

Treatment.—Primarily must be directed to the initial disease, but much in the interval may be done for the relief of the child. All depleting measures must be avoided, in spite of the popular impression in these cases that the disease has “gone to the head” and that leeches and ice-bags are required. On the contrary, the frequent use of stimulants, wine, coffee, and opiates will yield the best results. Caffein and strychnia are also valuable.

9. INSOLATIO (SUN STROKE).

Symptoms.—Headache and reddening of the face, neck, and arms—erythema—after long exposure to sunlight. In the

course of twelve hours there may appear loss of consciousness, furious delirium, injection of the conjunctivæ, contraction of the pupils, and strong pulsation of the carotids with fever. The pulse is quickened and rhythmic.

Progress.—Usually in from one-half to two days deep sleep ensues, from which the children awake conscious and without fever. More rarely death occurs early with increased stupor—edema of the brain and edema of the lungs.

Prognosis.—Almost invariably favorable.

Treatment.—Ice or cold effusions to the shaven head; vinegar enemas. Calomel after the return of consciousness.

10. HYPEREMIA CEREBRI.

Etiology.—Strictly speaking a symptom and not a distinct disease. May be premonitory of meningitis, apoplexy or hypertrophy, or result from arrested circulation, due to cardiac or pulmonary lesions, facial erysipelas, etc.

Symptoms.—Tension of the fontanelle, if it is still open, but if it has closed there is marked injection of the retina (ophthalmoscope). Redness of the face and conjunctiva may also be present or absent. The cerebral disturbances of high fever and acute infectious diseases must not be regarded solely as hyperemia, but as the effects of the fever or toxemia upon the brain.

Prognosis varies according to the fundamental lesion. Always doubtful.

Treatment.—Ice-bladders on the head, local blood-letting, lessening the heart's activity (veratrum, aconite, etc.), with large doses of calomel and cutaneous derivatives; ergot in full doses.

11. MENINGITIS CEREBRI SIMPLEX ET PURULENTA.

Etiology.—Commotio cerebri, traumatic injuries of the skull, traumatic erysipelas, or insolation, or the influence of great cold, excessive mental exertion, or the extension of a neighboring inflammation from the ear, more rarely from the eye, or venous thrombosis. Septic meningitis in typhoid, pneumonia, etc.

Symptoms.—Usually vomiting, though this may be absent, violent headache, retracted abdomen and increased temperature,

especially of the head ; convulsions. The disease usually reaches its height in one or two days, and is characterized by furious delirium and often violent convulsions and rigidities. The features are wild and the pulse irregular, frequently slow.

Course and Pathological Anatomy.—Recovery is possible, though rare. A favorable termination may be hoped for with an abatement of the more violent symptoms. Extreme emaciation and persistent feebleness of the mind not unfrequently attend cases which survive. Death usually in three to six days, and the autopsy shows the dura and pia covered with a yellowish-green fibrinous or purulent exudate. Or adhesions between the pia, the arachnoid and the cortex of the brain, the former appearing as a dense membrane.

Prognosis.—Poor.

Treatment.—If any is hopeful, it might be on the line of mercurial inunctions, oleate or blue ointment, to the shaven scalp two or three times daily, with cold affusions or ice in the intervals. Ergot and bromids in large doses may relieve the headache and delirium.

12. TUBERCULAR MENINGITIS.

Synonyms.—Acute hydrocephalus ; morbus Whythi.

Pathology.—Basilar meningitis caused by tubercular deposit in the intima of the vessels of the pia.

Symptoms and Course.—Prodromata are usually obscure and characterized chiefly by unusual irritability, gnashing of the teeth, starting in sleep, and pain in the forehead. Frequent vomiting, without any relation to indigestible food, is a suspicious symptom, especially if to this be added increasing headache and irregular evening exacerbations of fever. The pulse now becomes quickened ; previously it is curiously irregular, and sometimes there is delirium, especially at night. The countenance is flushed, sleep is disturbed and broken with a sudden sharp cry—*cri encephalique*. Or there may be somnolence, clutching at the hair, and irregular twitching. In a few days the neck becomes rigid—most marked when the child is sitting—with later general opisthotonos. Or there may be unilateral facial paralysis, the mouth dropping on one side.

The eyelids are half closed, the conjunctivæ injected, and the pupils, when visible, unequally dilated, and often showing a hazy zone about the edge of the iris—*Skeer's line*. With this may be associated difficulty of hearing and slowness of apprehension, the child answering only after repeated questionings, or not at all. About midway in the disease the pulse becomes slow (60-40) and wavy, while the temperature continues high. If the fontanelle is open it becomes protuberant from effusion into the ventricles of the brain and respiration drops to ten to twelve in a minute. The course of the disease is perplexing from its apparent improvement at times, when the appetite returns, consciousness is normal, etc., but these are usually fallacious, for they precede deepening coma and often hemiplegia. The child loses control of its sphincters, the face is pale or livid, and pressure upon the skin leaves persistent redness behind—*tache meningéal*. Temperature high. The average duration of the disease is about fourteen days, which may be extended to twenty, death, as a rule, resulting either from eclampsia or from edema of the lungs.

Differentiation and Prognosis.—The diagnosis of the onset of tubercular meningitis is often difficult, if not impossible. In certain of its symptoms it closely resembles gastric catarrh, in others cerebral hyperemia, and in the early course of the disease it may easily be mistaken for typhoid fever (*vide* p. 108). The relation of pulse to respiration and temperature should be carefully observed, as an aid to the differentiation. Vomiting, constipation, and the retracted or scaphoid belly are among the indicative later symptoms, and when the ophthalmoscope can be used it may reveal tubercularization of the retina also. Unfortunately, in the great majority of these cases the diagnosis must be confirmed by an autopsy.

Pathological Anatomy.—Usually an increase of fluid in the ventricles of the brain, with infiltration of contiguous parts with serum. Pia at the base of the brain covered with a fibrinous exudate, and showing by transmitted light along its blood-vessels disseminate or coalesced reddish-gray nodules from the size of the point of a pin to well-marked patches. Associated with this may be caseous degeneration of the brain-substance and localized hemorrhage, and very rarely there is cicatricial thickening of the

cerebral membrane. Miliary tuberculosis of other organs—liver, bronchial glands, spleen, etc.—can usually be demonstrated.

Treatment as yet is extremely unsatisfactory. The earlier methods of blistering, purging, and mercurials are useless and the same will probably be found true of the proposed draining of the subarachnoid spaces, after which recoveries have been reported. Gibney reports a remarkable series of recoveries under large doses of ergot and the bromids. Iodoform inunctions to the shaved head are highly spoken of by competent German authorities, but neither of these methods have produced any permanent results in the hands of the writer. Ollivier suggests many of the reported cures were not those of tubercular meningitis but of hysteria.

13. ENCEPHALITIS, or inflammation of the brain substance, either with or without the formation of abscess, differs in no respect in the child from its course in the adult. The same is true of—

14. PACHYMENINGITIS INTERNA HEMORRHAGICA.

15. HEMORRHAGIA CEREBRALIS ET CEREBRO-MENINGEALIS.

16. EMBOLISM OF THE CEREBRAL ARTERIES.

17. THROMBOSIS OF THE CEREBRAL SINUSES.

Etiology.—Marasmic conditions (five-eighths of all attacks), after Asiatic cholera, or cholera infantum, with atrophy of the brain, post-typhoid fever, or profuse suppurations. Also arises from compression of a sinus, or veins of the neck, of the superior vena cava, by enlarged lymphatic glands or abscesses, or from inflammatory processes in the neighborhood of the sinus—over one-fourth of the attacks in children—especially from caries of the temporal bone, ozena, or ecthyma of the head.

Symptoms.—Sudden loss of consciousness, somnolence, tetanic contractions of the muscles of the neck and back, tetany of the fingers and toes, nystagmus, and possibly paralysis of the facialis and oculo-motorius, with finally embolism of the pulmonary arteries. According to Gerhardt its location may be diagnosed as follows :—

1. Less tension in the external jugular vein of one side than the other denotes a thrombosis of the transverse and inferior petrosal sinuses of the side with the diminished tension.

2. A circumscribed, edematous tumor behind the ear denotes a thrombosis of the transverse sinus and of the veins back of the ears.

3. Venous hyperemia of the fundus of the eye by ophthalmoscope, with slight exophthalmus and edema of the upper eyelid, or of the whole half of the face, denote most frequently a thrombosis of the cavernous sinus. In addition, there are also the symptoms of irritation or paralysis of the ophthalmic branch of the fifth nerve, and the nerves of the muscles of the eye, although the thrombosis of transverse and inferior petrosal sinuses also present the same symptoms.

4. Cyanoses of the face and tension of the anterior fontanelle, with circumscribed perspiration of the forehead and nose, with epistaxis, indicate thrombosis of the superior longitudinal sinus, or bilateral thrombosis of the transverse sinus.

Course.—The formation of a thrombosis is always accompanied with an elevation of temperature and a quickening of the pulse in marasmic children, with whom death occurs in from one to five days. In inflammatory thrombosis death sometimes does not take place before the twenty-first day. Recovery in the latter case is possible, as has been proven, by organization of the thrombus, fatty degeneration, and subsequent canalization of the vessel. Even in embolic infarct of the lungs this may happen, provided the embolus was not septic.

Prophylaxis.—Prevention of collapse, if there is diarrhea (see *Cholera Infantum*, etc.), careful treatment of the suppuration of the middle ear.

Treatment in inflammatory thrombosis should be the application of ice to the head, and the internal use of quinin. Wine, ether, and musk are indicated in the marasmic variety. Aromatic spirits of ammonia will also be found serviceable.

18. CEREBRAL TUMORS.

Etiology.—Either congenital or acquired, and may be either cysts, gliomata, enchondromata, entozoic, aneurismic, sarcomata, carcinomatous, or more frequently syphilitic gummata, caseous tubercles, or results of traumatism.

Pathological Anatomy.—Localized caseous degeneration closely resembles the like affection of the bronchial glands, and may be distinguished at the autopsy from cerebral abscess by the absence of pus in the tuberculous spots, which are, as a rule, located in the peripheral, gray substance of the brain, which becomes adherent to the pia and dura. Foci are also found in the corpora striata, and may calcify, or cicatrize, but more frequently terminate life by the occurrence of secondary miliary tuberculosis of the meninges, lungs, or bronchial glands. Cerebral carcinoma is rare in children, and when seen is always medullary, and generally primary.

Symptoms, as with the adult, vary with the location of the neoplasm.

Treatment.—Palliative, or operative, according to the location of the growth.

(B.) DISEASES OF THE SPINAL CORD AND ITS MEMBRANES.

1. SPINA BIFIDA, OR HYDRORRHACHIS,

A congenital deficiency in the bony covering of the spinal cord, appearing as a fluctuating tumor, when the membranes are intact, usually located in the sacral region, though it may also be cervical. Harelip, extrophy of the bladder, and other congenital malformations are frequently associated. Spina bifida may consist, according to its location, of merely a longitudinal slit in the bones of the spinal column, or a broad, pedunculated tumor, with greater or less absence of the vertebræ which should cover it. It may be flat, ovoid, pear-shaped, or like a tail, and is covered either with normal or atrophic cuticle, or this may be entirely gone, the spinal cord covered only with its arachnoid and dura. These may be ruptured during birth, or in utero. Spina bifida fluctuates, and contains the spinal fluids, in which, especially if the cutis is absent, one can observe respiratory movements. The spinal cord may run normally, but when there is a division of the lower lumbar vertebræ a part of the cauda equina is generally contained in the tumor. By pressure the tumor is always somewhat lessened, but at the same time hydrocephalus, when it is present, is in-

creased. Pressure frequently produces convulsions, and is always painful.

Progress.—If the sack has been ruptured during birth death soon follows from meningitis spinalis suppurativa ; even if the child is born alive, with the coverings intact, they may become gangrenous, and end life by septic meningitis. Or life and the coverings may remain intact and the latter gradually thicken, and sometimes paralysis of the bladder, rectum, and feet intervene thereafter. Very rarely is life preserved for a term of years.

Treatment.—Repeated punctures, with the withdrawal each time of a small amount of fluid and the injection of diluted tincture of iodin, in the hands of Dr. Brainard, gave many reported recoveries. Others have not been so fortunate, their cases dying from spinal meningitis, though latterly a gratifying series of cures after plastic operations have been reported, Robson for instance reporting 16 recoveries after 20 operations, strict antisepsis of course being preserved.

Other tumors of the cord are met with, either of the gray substance, or external neoplasmata, or joined or partially developed twin births. There is also a very rare form of tumor, consisting of hypertrophied Luschka's glands.

Hyperemia, inflammation and hemorrhage into the cord present in the child the same symptoms and require the same treatment as in the adult, hence hyperemia, spino-meningealis, myelitis, hemorrhagia spinalis et spino-meningealis need no extended discussion here.

2. NEURALGIÆ.

Are frequently met with in childhood ; especially frequent are migraine and the abdominal neuralgia referred to on page 128. Megrim may be differentiated from ordinary bilious headache by the absence of previous indigestion, foul tongue, etc., by the periodicity of megrim, its sudden onset, disturbances of vision, hearing, etc., and by its abrupt cessation and excellent health in the intervals between its paroxysms. It undoubtedly is a neurosis and often hereditary, probably due to an excess of retained uric acid. Its treatment should be both prophylactic and alleviative. The latter can usually be promptly

accomplished by means of full doses of antipyrine or antifebrin, in aromatic spirits of ammonia and water, or fluid ext. ergot (m̄xv-xx). The prevention of the return of these attacks requires restriction of meat diet and regulation of life and study by the physician, for otherwise these "storms" become a settled habit, often recurring, although they have no appreciable effect upon length of life.

Pleurodynia, or intercostal neuralgia, is often malarial in origin, and can be promptly relieved by full doses of quinin and applications of a menthol lotion.

Cardialgia—neuralgia cardiaca—may be caused by acute indigestion, malarial poison, or in anemic girls before menstruation. Similarly *neuralgia vesicalis* is caused, both from stone in the bladder, vesical catarrh, thread-worms or masturbation.

Treatment.—Pro re nata.

(C.) NEUROSES OF MOTILITY.

(a.) TETANUS TRAUMATICA.

Traumatic tetanus is not infrequent with boys, its more frequent causes being toy cap pistols, or punctured infected wounds. For symptoms see p. 26.

Prognosis is more favorable than in adults, or in the tetanus of the newborn.

Treatment.—Morphine, woorara (0.01–0.25 per dose), and extract calabar bean, are best administered subcutaneously. The removal of foreign bodies from wounds, ears, or nasal cavities should also be carefully attended to. Tetanus antitoxin gives promise of being of great value in the treatment of tetanus.

(b.) ECLAMPSIA.

Synonyms.—Convulsions, Krämpfe; "Inward fits."

Definition.—Tonic or clonic spasm of the voluntary muscles, either in whole or part, accompanied with loss of consciousness.

Etiology.—The causes of eclamptic attacks in children are so numerous that it would be impossible to mention them all in a work like this, but they may be conveniently divided into (a)

thermic, (*b*) toxic, (*c*) symptomatic, and (*d*) reflex. Such attacks are seen most frequently between birth and the completion of dentition. Incomplete eclamptic attacks—"inward fits"—often attend indigestion with flatulency and colic, especially in bottle-fed babies. Eclamptic attacks are most common with rachitic and illy-nourished children, and in the so-called neurotic families, with whom convulsions may be hereditary. Symptomatic or reflex convulsions may be produced by continued pain at any point, or from pressure on the head during birth, tubercular or simple meningitis, craniotabes, etc. Toxic eclampsia follows alcohol and other narcotic poisoning, and is often seen in the præruptive stage of the exanthemata, though here possibly it is due to the high temperature as well. A toxic convulsion in children often replaces the malarial chill of the adult, and the same may be seen in pneumonia, etc. Breast milk, disordered by anger, etc., on the part of the mother, may do the same, and auto-poisoning, from the production of toxic leucomaïnes in the intestines, is undoubtedly the cause of not a few of the convulsions of early childhood. Thermic convulsions are liable to occur whenever the child's temperature reaches 104° F.

Symptoms.—The mildest form of eclampsia is that in which there is a slight drawing to one side of the eyeballs, quivering of the muscles of the face—*risus sardonius*—or twitching of the extremities during sleep. Or the child may have a veritable attack of "night terror," awaking screaming and bewildered, for a variable length of time. If the causes of these attacks be not removed, they are repeated with greater frequency, until at last a true eclamptic attack appears. An ordinary eclamptic attack usually consists of several convulsive paroxysms, with intervals of unconsciousness and insensibility. During these all the voluntary muscles may become rigid or twitch, the teeth gnash, the eyeballs roll, and foam run from the mouth. Respiration is irregular and quickened from implication of the glottis and the inspiratory muscles, and death may ensue from asphyxia. Generally, however, the spasm of the glottis relaxes under the accumulation of carbon dioxid in the blood, and life is thus provisionally prolonged. The urine and feces may be involuntarily passed. An eclamptic attack ordinarily ends in sleep or coma, proportion-

ate in length to the previous attack, from a few minutes to a half hour or more.

Prognosis.—Milder attacks frequently repeat themselves, if the cause persists, while severer attacks may occur but once. They may terminate in immediate death, though this is the exception rather than the rule. It may be said, in general, that the younger the child the more unfavorable the prognosis. Repetition of convulsions, persisting more than a few minutes, point to serious disease of the central nervous system, and in such cases, although life may be preserved, permanent injury, such as idiocy, paralysis, hydrocephalus, etc., is liable to be left behind.

Treatment must, of course, always be directed to the removal of the cause, when this can be found, but often immediate relief must be afforded before the exact etiology can be discovered.

| (30) | | | |
|--|-----------------------------|-----|----|
| R. | Potass. bromid., | 4 | |
| | Chloral. hydrat., | I | |
| | Aqua pura, | 60. | M. |
| Teaspoonful every twenty minutes for child one year old. | | | |

By the mouth, or in double doses by the rectum, until the convulsions are quieted. If we suspect intestinal obstruction, the bromid may be preceded by full dose of calomel (gr. ij-iv) placed on the tongue.

If the exciting cause is still in the stomach, a prompt emetic of gr. j turpeth mineral may give most satisfactory results. Where the temperature is heightened, nothing will give better results than sufficient antipyrine to bring it to normal, conjoined with warm baths and cutaneous derivatives—mustard to feet, calves, etc., which are especially helpful in cerebral congestion. The child should be completely undressed, both for the purpose of properly examining it and for ease in giving a bath if necessary, which should never, in the excitement of the occasion, be made hotter than the mother or nurse can put her tongue into with safety.

(c.) EPILEPSY.

Definition.—Epilepsy differs in childhood only in a few minor points from epilepsy as seen in the adult. Chief among these

may be mentioned the fact that with children the aura is usually absent or not recognized by them, and epileptic attacks recur more frequently with the child. The paroxysms are, as a rule, lighter, and falling may not occur, the vertigo epilepticus taking its place. This constitutes the minor form whose attacks do not last over a minute. But there is also a grave form in which the child falls with a sudden outcry, perhaps inflicting serious injury upon itself in so doing, and showing all the symptoms of graver epilepsy in the adult.

Etiology.—As varied as in the adult. Haig believes that epileptic attacks are precipitated by an accumulation of uric acid in the blood, resulting in spasm of the vaso-motor system of the cerebral arteries. It is well proven that continued irritation of any kind, such as a tight prepuce, pressure from a scar, constipation, etc., may bring on epileptic fits in a child predisposed thereto, but the essential nature of epilepsy is not clearly understood unless we agree with those who consider it a degenerative process intermediate between iodicy and insanity.

Prognosis.—At best only fairly hopeful. Puberty, onanism, and the use of alcohol make the attacks more frequent. The milder forms of epilepsy have no effect upon the mind, but the grave forms produce mental hebetude, and at last imbecility.

Differentiation.—Eclampsia can only be distinguished from epilepsy by the frequency of the attacks in the latter. Simulated attacks may be known by the absence of cyanosis during the attack and the lack of subsequent pallor of the skin.

Prophylaxis.—Marriage should not be permitted among epileptics, and epileptic mothers should employ a healthy wet-nurse (K.). Over-exertion, especially mental, should be carefully avoided, as well as fright, pain, and the reading of exciting and pernicious literature.

Treatment must first of all aim to remove exciting causes. If tumors, or cicatrices press upon or irritate nerves, such tumors are to be extirpated. Worms must be expelled and onanism prevented. Derivatives of cantharidal collodion, mustard, or pustulating ointments are useful in cerebral troubles, while trephining may be necessary where the bones of the skull are depressed. Where these things are impossible, or have proved of no avail,

strict attention must be paid to the diet and the preservation of the general health of the patient. The food must be good, but not largely nitrogenous, and spirits are to be avoided. Frequent exercise in the open air, daily movement of the bowels, repeated baths and sweatings, with journeys to warmer climates, are all of value. Education should be preferably at home rather than at school. Medicinally this recipe is useful :—

(31)

R. Pot. bromidi., ʒvj
 Sodii bromidi., ʒij
 Tinct. cinch. comp., ʒj
 Simple elixir, ʒiij.

H.

SIG.—Teaspoonful four times a day.

Bromism may be remedied by adding small doses of Fowler's solution three or four times a day.

It should also be remembered that, in many children, the continued use of the bromid produces constipation and sluggish action of the kidneys which may require attention, especially in the way of the free use of lithia or pure spring waters.

(d.) SPASMUS NUTANS.

Etiology.—A rare affection of early infancy, occurring as early as the sixth or eighth month, following either trauma, exhausting disease or eclampsia. Milder attacks are supposed to be reflex; severe ones are thought to result from pathological changes in the brain itself, whose exact nature are as yet unknown.

Symptoms.—This affection is essentially a spasmodic nodding of the head, continuous or intermittent, often preceded by twitching of the facial muscles, nystagmus, or cramping of the muscles of the arms.

Prognosis.—Spontaneous cures are possible in the course of a few months. These are those cases which are produced by transient reflex irritation. The prognosis, in those of central origin, is unfavorable, for such often terminate in idiocy or epilepsy.

Treatment.—Removal of cause, when this can be discovered.

(e.) CHOREA MINOR.

Synonyms.—St. Vitus' Dance, Veitstanz, "Tic."

Definition.—Involuntary movements of more or less of the striated muscular fibers, increased by attempts at coordination and ceasing during sleep or unconsciousness.

Etiology.—More frequently seen in girls than boys, but generally of shorter duration than with males. Owing to the general nervous instability of the child, chorea is one of the most frequent nervous affections of childhood, especially in neurotic families, or where education has been unduly pushed, or such children have been severely frightened. The causal relations of rheumatism and eye-strain to chorea, while not proven, are strongly suggested as exciting causes from their frequent association, especially in the case of rheumatism with complicating endocarditis.

Symptoms.—The involuntary movements of the muscles are not at first very clearly marked, but later restlessness shows itself during the whole day, either in all the muscles of the body, or the muscles of the head and face may be exempt, and the extremities attacked—either alike, or on one side, or crisscross, *i. e.*, the right arm and the left leg, or *vice versa*. Sometimes the restlessness is greater on one side than the other; but the muscles are never for an instant perfectly still, except in quiet sleep. Even vivid dreams produce choreic movements. The arms shake and are jerked out of place; the fingers are sometimes flexed, sometimes extended and pick aimlessly at the clothing. When such actions are noticed, the child becomes more and more awkward and its movements less under control. The feet totter and jerk irregularly, the gait is uncertain and stumbling, until, in the severer forms of the disease, walking becomes impossible. Where the head and trunk are implicated, they are moved to and fro in all sorts of shakings, bowings and jerkings. The child may vary this by "making faces," running out its tongue, etc. Speech is always difficult and generally stammering. Deglutition, from the implication of its muscles, exceedingly precarious, so much so that pills ought never to be given in these cases. An attempt at mastication often results in biting the cheek or tongue and involuntary gnashing of the teeth follows swallowing food. The choreic

movements are increased by attempts to prevent them, so that such children become at times entirely unable to write, eat or walk so long as they are watched, especially if they expect to be reproved for their clumsiness. In very prolonged cases the memory may become weakened.

Pathological Anatomy.—None pathognomonic of the disease. "Now this affection arises from some humor falling upon the nerves," wrote Sydenham more than 200 years ago, and the latest physiological experiments seem to show that this "humor" arises from xanthin and its derivatives. The most frequent lesion found is the occurrence of endocardial vegetations about the valves of the heart.

Progress and Prognosis.—Chorea may be cut short by intercurrent disease, but it usually culminates in from three to six weeks, then remains in statu-quo from five to seven weeks, and from this point begins to improve, though liable to frequent relapses, but ultimate recovery almost invariably ensues (six months average). Epilepsy, idiocy, death following coma, and chronic chorea are, however, possible sequelæ.

Treatment must be directed to the general condition, especially if there is anemia or chlorosis, which require iron, good food and air. Worms must be expelled by means of cathartics and anthelmintics; improper residence, if possible, is to be changed, and onanism and rheumatic diseases of the heart should be carefully looked after. Chloroform inhalations may be (rarely) employed in violent paroxysms, and when the violence of the movements prevents sleeping, we should endeavor at night to make the child's position as comfortable as possible by well fitting and padded braces. Great care should be given to the mental condition of the child, who should not be allowed to be either frightened or threatened, on any account, nor should it be sent to a public school. Rewards and encouragement should be freely resorted to, and massage is a valuable adjuvant to any method of treatment. Goodhart advises forced feeding, and when the child can be put under suitable care the annexed diet table will be found of great value, remembering that chorea is a disease of malnutrition, requiring butter, cream and fats.

DIET TABLE.

- 6.30 *A. M.* Oss warm milk.
 8.00 Oss milk and $\bar{3}$ ij bread and butter.
 9.45 $\bar{3}$ ss Malt Extract, or cocoa.
 10.00 Massage for fifteen minutes, followed by Oss warm milk.
 12.30 *P. M.* Rice pudding, milk, potatoes, and vegetables.
 4.45 Oss warm milk, $\bar{3}$ ij bread and butter and soft egg.
 7.00 $\bar{3}$ ss Malt Extract, followed in half hour by Oss milk.

At the end of ten days the bread and butter are to be increased to four slices at the 8 and 4 o'clock meals, and a chop or steak added at the noon. Of drugs, Calabar bean (0.05 gm. powder t. i. d.) and arsenic have the best reputation for the relief of chorea. Arsenic is best given to children as Fowler's solution, increasing the dose one minim daily until symptoms of arsenical poisoning appear, when the dose should be diminished one-half, or discontinued for one week, and then recommenced at the minimum dose. Antipyrine, when not otherwise contraindicated, has a decidedly beneficial effect in lessening the violence of chorea, and can be used with advantage also in what are usually known as choreiform spasms. The writer has obtained excellent results from salicin (gr. v t. i. d.) in chorea of rheumatic origin, and in similar cases Atkinson speaks highly of chloral hydrate and fl. ext. cimicifuga combined, as follows:—

| | | | |
|------|----------------------------|----------------|-------------|
| R. | Chloral hydrat., | $\bar{3}$ ij | |
| | Ext. cimicifuga, | f $\bar{3}$ ij | |
| | Elix. simplicis, | $\bar{3}$ iij. | M. |
| SIG. | — $\bar{3}$ j q. 3 hours. | | (Atkinson.) |

(f.) CHOREA MAJOR.

Synonyms.—German Saint Vitus' Dance; Hysterical chorea.

Definition and Differentiation.—Usually distinguished from ordinary chorea by the rarity of the major variety and by its disturbance of consciousness and abolition of reflex movement.

Etiology.—It is especially apt to attack girls about the time of puberty, and generally appears upon retarded or irregular menstruation. Much more rarely boys are attacked about puberty;

and it is well authenticated that the disease is hereditary, but generally a predisposition to this condition arises from improper education by a hysterical mother. The previous conditions of the brain are unknown, except that there is heightened irritability of the sensorium and the motor nervous system.

Symptoms.—After a prodromal period, which varies and is marked by dreams, restless sleep, anxiety, timidity, pains in the head and back, and disturbances of digestion, violent paroxysms appear with varying frequency and duration—a few minutes to several hours. These attacks consist of the most complicated and apparently voluntary movements—dancing, jumping, and climbing. At the same time, or instead of these irrational motions, the patient chatters the most nonsensical stuff until the paroxysm passes by, when the girl falls into a long deep sleep, from which she awakens without any remembrance of what she has been doing or saying.

Progress and Prognosis.—Sometimes the disease is limited to a single attack, or there may be a succession of them upon a single day. Or they may occur at intervals of several weeks, or even further apart. The prospect for life is always favorable, though not for intellectual vigor, for such girls are very apt to become mentally unstable women.

Treatment should be directed, first of all, to the regulation of menstruation, for when this is accomplished it usually brings a cure with it. This generally requires an improvement of the general condition of the child, any relapse from which is liable to bring on again the paroxysms. Improper reading and company must be carefully looked after, and especially care should be taken that no one relates to the child what it may have said or done during the attack. Iron, quinin, and manganese are helpful against the chlorosis and anemia, cathartics for constipation, with mustard foot baths, or mustard plasters to the thighs, and salt sitz baths for suppressed menses. During the attacks care should be taken to prevent injuries to the body. Often we can bring the patients back to consciousness by sudden cold effusions, or a sharp reproof, as in true hysteria. Hydrotherapy is well spoken of by French physicians, but drugging is to be avoided and gymnastics substituted.

ARTHROGRYPOSES.

Definition.—Tonic cramp of localized groups of muscles.

Etiology.—Most frequently in weakly children from one to three years of age, and by preference among boys and during the cold season of the year, or in convalescence. The disease is either symptomatic of various cerebral lesions, *e. g.*, caseous degeneration, apoplexy, etc., or is idiopathic with unknown causes; in the latter case it is without fever.

Symptoms.—Individual groups of muscles, especially of the extremities, are persistently contracted. Sometimes there are edema and erythema of the limbs in addition. By examination, it seems as if pain only arose from the action of the opposing muscles. Generally both sides of the body are simultaneously affected, *e. g.*, both arms are flexed to a right angle at the elbow, hand and metacarpal joints, and the thumb emballed in the hand. Or the feet may be extended, with contraction of the muscles of the calves, while the toes are either extended or bent. Alteration in the disposition often attends these cases, the child being depressed and sad without reason.

Progress and Prognosis.—The disease is usually of protracted duration and with frequent relapses, and prognosis is favorable only in the idiopathic variety.

Treatment.—The main thing is to maintain the strength by means of good diet, iron, quinin, etc. The cramp of the muscles may be combated by means of baths, warmth, the internal use of opiates or hydrate of chloral, and external narcotic rubbings.

NEUROPATHIC FACIAL ATROPHY.

Etiology depends upon a deficient development of one-half of the face. Its peripheral causes are burns, scrofulosis of the cervical glands, abscess of the tonsils, etc., while the central ones are apoplexies, etc. Girls are more frequently attacked than boys, and in the majority of cases the left half of the face is the part affected.

Symptoms and Course.—Either half or the whole of the face may become affected by the extension of the atrophy. The

parts are pale, the bones remain small, and the muscles less developed than normal. One-half of the tongue is apt to be atrophic, and one eye smaller than the other. The hair falls out or turns gray upon the affected side, which appears considerably older than the other. No changes in the arteries.

Prognosis.—Bad.

Treatment by electricity up to the present time has been without results.

MOTOR PARALYSES, CENTRAL AND PERIPHERAL.

The traumatic and rheumatic paralyses of children differ in no respect from those of adults. We have already made mention of diphtheritic and symptomatic-central-paralyses, which are found in connection with lesions of the brain, spinal cord, and bones, but there are four other forms of paralysis which especially deserve our attention.

ESSENTIAL PARALYSIS.

Synonyms.—Anterior poliomyelitis, infantile paralysis.

Etiology.—The period of dentition, especially during the cutting of the molars, seems to act as a predisposing cause. Most frequently exposure to cold is the exciting cause, although essential paralysis sometimes follows typhoid fever or the exanthemata, and in others the only thing abnormal noted has been persistent constipation or passive congestion of the brain.

Pathological Anatomy.—Atrophy of the trophic centers in the anterior horns of the gray matter, though later extension may take place to other parts of the cord. The motor cells are shrunk with granular degeneration of the involved nerve elements and subsequently of the affected muscular fibers.

Symptoms.—Partial or entire loss of motion and sensibility in one or both of the upper, or more often, of both the lower extremities. Such paralytic attacks may come on suddenly, or be preceded by fever, difficult dentition, or by eclampsia, and sometimes the paralyzed part is the seat of sharp pain for several days. The paralyzed arm hangs helplessly down and cannot be raised, but sometimes, when only the muscles of the upper arm are paralyzed, the motility of the fingers is preserved. It is also rare that

all the muscles of the paralyzed feet are affected. The sphincters of the bladder and rectum are intact, even when the child drags both feet in walking.

Progress.—Sometimes the paralysis disappears entirely or partially after two or three days, or in as many weeks, without leaving any sequelæ behind, or it may persist for months. In the latter case it leads to atrophy of the inactive muscles, which is especially noticeable in partial paralysis of the shoulder with atrophy of the deltoid, or in the lower leg with contractions, such as club-foot, genu valgum, etc. With these are associated a weak pulse, a lowered temperature of the skin, and sometimes edema of the affected members, and, lastly, imperfect development of the paralyzed member.

Prognosis is favorable for life, but not always so for recovery.

Treatment.—Symptomatic. None of the remedies usually employed can shorten the course of the disease. During the first week the affected limb should be kept warm, and stimulating embrocations should be tried. After the paralysis has persisted for a month, we should endeavor to overcome the muscular atrophy by means of electricity and massage, daily applied. Of drugs, the only ones of real value are the iodids and strychnia in some form or other, long continued. Ergot is thought to be useful if the case is bad at the onset.

PARALYSIS MYOSCLEROSICA, ATROPHIA MUSCULORUM LIPOMATOSA.

Definition.—A thickening of some and atrophy of other muscles, but the distinguishing feature is a sub-paralysis of them all.

Etiology.—Bad nourishment, poor dwellings, rachitis, scrofulosis, or other nutritional diseases. It nearly always attacks boys.

Symptoms.—If the disease begins early in life, children do not learn to walk until late, and walking is difficult, such children become easily tired, and have pains in their legs, which increase in size. Finally, the gait becomes uncertain, and walking is only possible on the toes. Rising becomes difficult, and can be accomplished only by strenuous exertions. The thoracic muscles are atrophic, while the muscles of the calves of the upper and lower thigh and of the upper arm are either all or partially hypertro-

phied. In the latter condition atrophic spots and knotty projections alternate with each other in the same muscle. At the same time the normal curvatures of the spine become exaggerated, producing lordosis and kyphosis. The electric contractility of both the atrophic and hypertrophic muscles is diminished, while, curiously, taste is apparently heightened. The disease usually pursues a steady course for the worse for several years, though rarely a halt is observed. As chronic atrophy of the muscles advances, dyspnea increases until suffocation may appear.

Prognosis.—Bad.

Treatment of any value is as yet unknown.

PARALYSIS NERVI FACIALIS.

The same form of disease that occurs from pressure of the forceps (see page 38) can also be brought on later in life by caries of the petrous portion of the temporal bone, induration of glands, or scars in the neighborhood of the facial nerve.

Symptoms.—At first the paralysis is recognizable only during laughing, crying, or speaking, because then the muscles of one side of the face remain quiet; later, the paralyzed half of the face becomes expressionless, even when in rest. The affected corner of the mouth hangs down and tears flow over the cheeks, while in central paralysis the uvula hangs awry.

Progress and Prognosis vary according to the cause of the disease. After petrosal caries, persistent paralysis almost always is left behind.

Treatment.—Cicatrices and infiltrated glands must be removed. Caries of the temporal bone requires the assistance of the aurist.

PARALYSIS OF THE SERRATUS.

Etiology.—The paralysis may be peripheral, resulting from various traumatic causes, or cold, affecting the course of the nervus thoracicus longus, to which alone the serratus anticus major owes its innervation. When the causes are peripheral, the paralysis is unilateral, and more often over the right side, but when the causes are central, the paralysis is bilateral, and is often combined with atrophy and paralyzes of other muscles.

Symptoms.—After transient pains in the supra-clavicular

region, the arm can be raised only to a horizontal position, and at the same time it is observed that the shoulder blade has so twisted itself that its inner edge projects from the thorax, like a wing, with curvature of the spinal column; but if the shoulder blade is held fixed in its proper position, the arm can be raised and the spinal column straightened. Later, the muscle becomes greatly atrophied.

Prognosis.—Seldom favorable.

Treatment.—Stimulating liniments or cupping to the supra-clavicular region, with massage and the battery, comprise all that can be done for such cases. Strapping may give temporary relief.

THE ORGANS OF SPECIAL SENSE.

(a) SMELL.

The sense of smell is sometimes wanting from a congenital absence of the olfactory bulb, but more often its defects arise from chronic catarrh acquired early in life.

(b) HEARING.

1. **Congenital deafness**, often combined with absence of speech—deaf and dumbness—proceeds either from malformations of the inner ear or from central disturbances. The intellectual functions of the deaf and dumb are often preserved intact, and by instruction in the appropriate institutions become brilliantly cultivated.

2. **Malformations of the Ear.**—There may be complete or partial absence of the pinna of the ear—*defectus auriculæ*—which can only be corrected by wearing an artificial ear; usually not necessary for defective hearing. Furthermore, the ears may lie flat on the cranium—*auriculæ adpressæ*—or stand directly out like the ears of a bat—*auriculæ vespertilionis*. These require to be bound down with bands of adhesive plaster for several weeks. Finally, there may be closure of the ear—*atresia seu imperforatio meatus auditorii*—generally only on one side. This closure may be either membranous or osseous, the latter of which occurs only with other malformations—hemicephalia, etc. Membranous closure may be safely removed by an operation; but in the treatment after

the removal of the obstructing membrane, it is most important that the canal should not be allowed to close itself again. As regards the treatment of the auditory organs, we must refer the reader to the special works on the subject.

(c) SIGHT.

1. **Malformations of the Eyelids and surroundings.** *Coloboma* of the cartilage of the upper lid, without fissure of the skin, is of no significance. *Epicanthus* is a semilunar fold of skin in both of the inner angles (canthi) of the eyes, whereby the root of the nose is abnormally flattened, and the integument covering the same encroaches upon the epicanthal folds, and may even reach the inner border of the cornea, but does not interfere with sight. *Epicanthus* sometimes disappears by a spontaneous cessation of its growth; when it persists for a long time, it can only be cured by cutting out of a fold of skin from the base of the nose, and closing the edges of the wound with fine sutures.

2. **Malformations of the Inner Eye.**—(a) *Coloboma iridis*, seu *iridoschisma*, is a fissure of the iris from below or sideways in different directions. Sometimes the pupil preserves its normal shape, and the fissure is separated from the pupil by cross-bars of iris tissue in the pupil. *Coloboma iridis* is rare and is more often double than single. The cause of *coloboma*, both of the cartilage of the upper lid and of the iris, is unknown; sometimes it is hereditary. The action of the fissured iris is very imperfect.

(b) *Irideremia*, partial or entire absence of the iris, is always double. Here, as in very marked *coloboma*, we can always see the fundus of the eye when it is illuminated by the proper light. These unfortunate children are always short-sighted, and are compelled to blink through the lids. Later, inflammation and haziness of the lens are very frequent, whence *nystagmus* arises.

Treatment.—Protection from the light by means of blue glasses and an artificial diaphragm.

3. **Atresia Pupillæ Congenita.**—The pupillary membrane, which should atrophy at the seventh month of pregnancy, persists either as an entire and transparent membrane, with few or no vessels, or it may be perforated or ragged. It weakens the power of sight and impedes the action of the iris. Through the traction

of the iris sometimes a sort of spontaneous cure occurs, the membrane being ruptured and the fragments atrophy.

Treatment.—Dropping in of a solution of atropin.

4. **Cataract**—*centralis seu neuclearis*—appears as a white, round opacity in the center of the lens, often complicated with some of the previous malformations. The lens is never entirely opaque, and the ability to see is greatly interfered with, but never entirely lost. Requires an operation.

Discussion of diseases of ear and eye, except as complications or malformations, is not attempted in this volume.

SECTION VIII.

DISEASES OF THE RESPIRATORY SYSTEM.

I. ACUTE NASAL CATARRH.

Synonyms.—Acute rhinitis, cold in the head, coryza.

Definition.—A self-limited catarrhal inflammation of the mucous membrane of the nose and frontal sinuses.

Etiology.—Often, if not generally, produced by a lithemic condition of the system. Sharp cold, a dusty atmosphere, the powdering of certain drugs, specific microbes, pollen, and other local irritants may produce nasal catarrh, which is also a symptom of measles, rubella, hereditary syphilis, rachitis, and may replace the sweating stage of malaria in children.

Symptoms.—Fever (101°), restlessness, malaise, and general aching often attend the lithemic form of rhinitis, which some consider closely allied to a mild rheumatic attack. The amount of discomfort depends largely upon the amount of swelling of the turbinated bodies, which, if great, produces loss of smell, headache, and general discomfort. The usual method of relief is by a profuse mucous discharge from this hyperemic mucous membrane, often so profuse as to keep a handkerchief nearly constantly in use for a day or two. Within forty-eight hours the discharge grows

thicker and yellow, and in a properly cared for case, entire resolution and return to a normal condition of affairs ought to take place within a week.

Treatment.—According to the writer's ideas, the essential things in the treatment of acute coryza are an equable atmosphere, restriction of diet, and the large use of fluids to flush out the system. The value of warm air may be enhanced by the inhalation of the vapor of hot water containing either spirits of camphor or menthol. Homeopathic tincture of camphor has a well-deserved reputation for the relief of incipient colds, but it should be remembered that it has three times the strength of the officinal spirits and must be used with caution, as eclamptic attacks have more than once resulted from its careless use. Except with young children, a small dose of Dover's powder may be used with advantage at bedtime to give a night's sleep, and aconite and phytolacca may be used during the day to reduce the fever and stimulate glandular activity. Lemonade containing a little liq. ammon. acetatis can be given freely, and, if the child is old enough to tolerate it, warm alkaline sprays afford much relief. Dilute Dobell's solution (1 : 4) or Seiler's tablets furnish a convenient method of use. Such tepid solutions are to be used in a hand-bulb spray, or with very young children to be dropped into the nose with a dropping tube. Liquid vaselin containing one to two drops of oil of wintergreen to the ounce should be used after the aqueous spray, and, if continued for a week or so after the subsidence of an acute attack, will do much to produce entire recovery.

Prophylaxis.—Regulation of diet and salt baths, lithia.

2. ACUTE CATARRHAL LARYNGITIS. •

Synonyms.—Pseudo-croup, spasmodic croup, angina stridulosa.

Varieties.—Illoway divides catarrhal laryngitis into three varieties, viz.: the mild (l. supraglottica), the severe (l. stridulosa), and the grave form (l. hypoglottica gravis).

Differentiation.—It should be remembered that syphilitic laryngitis causes chronic stridulousness, and that fibrinous exudates and edema of the larynx may produce attacks of croup, only to be

differentiated from the acute catarrhal form by the history of the case. Hence, we may find these so-called croupy attacks in any disease which may lead to edematous swelling of the larynx, *e. g.*, struma, papilloma of the larynx, etc.

Etiology.—Acute rhinitis is, next to chronic pharyngitis, the most frequent exciting cause of these attacks, which are common between two and four years, and have a marked tendency to repeat themselves. As the child grows older, pseudo-croup, as a rule, grows more infrequent, and is replaced by hoarseness and dry cough after fifteen years.

Pathology.—Hyperemia and tumefaction of the laryngeal mucous membrane, which is covered with muco-purulent secretion. Epithelium exfoliated, and in severe cases the epiglottis is deep red and swollen, hyperemic.

Symptoms.—During the course of a nasal or bronchial catarrh hoarseness, accompanied with a sharp metallic cough, suddenly appears. Grave cases begin suddenly in the middle of the night, with spasm of the glottis and labored inspiration, constituting the well-known attacks of croup. Children thus attacked sit up in bed, gasping and breathing with great difficulty. Their cough is stridulous and the pulse is quickened and there may be a mild grade of fever. After a little while these symptoms become intensified until the child breaks into perspiration, with whose appearance the fever sinks. As a rule there follow one or more lighter paroxysms, terminating in sleep. Generally this is followed the next day by a loose cough, and the hoarseness disappears in two or three days. In such children the appetite is only slightly diminished and it is impossible to keep them long in bed, for the whole attack ought to be concluded within a week, unless capillary bronchitis follow.

Differentiation at the time of the attack is often impossible, but we presume that the attack is pseudo-croup if it is sudden in its onset and paroxysmal in character. Diphtheritic croup is progressive, and in 50 per cent. of the cases membrane can be seen in the throat.

Prognosis.—Exceedingly good, although relapses may be expected for the succeeding night or two.

Treatment.—Occasionally the use of an alcohol and cold

water compress may abort a threatening attack of pseudo-croup, especially if to this may be conjoined the use of a steam atomizer, whose vapor contains a few drops of wine of ipecac, or paregoric. When these fail, prompt resort should be made to emetics, *e. g.*, wine of ipecac., \mathfrak{z} j every twenty minutes; turpeth mineral, gr. j, or the domestic remedies of alum and molasses, goose grease, etc., any of which will cut short the paroxysm as soon as emesis takes place, and sleep usually follows. The child usually requires some mild expectorant the next day (R. No. 33), and the writer has much confidence in the use of quinin and calomel (gr. j and $\frac{1}{10}$ gr.) three or four times in the day as a prophylactic to prevent the return of the paroxysms on succeeding nights. Subsequent attacks are usually milder and yield more promptly to treatment, and children never die from pseudo-croup, your professional rivals to the contrary.

3. LARYNGITIS CATARRHALIS CHRONICA.

Etiology and Pathology.—Acute laryngeal catarrhs, especially in children with consumptive parents, or in those where there has been undue use put upon the voice in singing, shouting, etc., often run into a chronic condition. Furthermore, actual morbid conditions of the larynx, such as are met with in true croup, pertussis, or from the passive hyperemia, produced by pressure upon the cervical vessels (tumors, caseous glands, etc.), lead to chronic laryngeal catarrh with consequent thickening of the laryngeal mucous membrane and varicose enlargement of its vessels.

Differentiation can be made certain by the use of the laryngeal mirror, by whose aid a diagnosis of the congestion of the vocal cords, or their paralysis, or the presence of foreign growths, etc., can be made.

Symptoms.—Hoarseness naturally results from the chronic congestion of the vocal cords, and this congestion is aggravated if the use of the voice is persisted in, hence the hoarseness is worse at night. The mucus expectorated, chiefly early in the morning, is liquid, grayish white, apt to come in small, roundish bits, and is easily raised.

Treatment should be especially directed to the detection of

the exciting cause and its removal if possible, as in case of undue use of the voice. Astringent sprays or insufflations are also of value, and some writers advise the application of nitrate of silver by means of the probang or brush. Far more successful than any of these is the removal of the child to a warm, equable climate, preference being given to a pine forest, when possible. Of internal remedies, the hydrate of terpene can be highly recommended either in capsules or tablets, or in a mixture like the one here given:—

TERPENE MIXTURE.

| | | | | |
|---|---------------------------|-----------|-------|----|
| R. | Hydrate terpene, | | ℥ss | |
| | Glycerinæ, | | | |
| | Syr. lactucarii, | | ℥ss | |
| | Syr. yerb. sant. aromat., | | ℥ijj. | M. |
| Half a teaspoonful to a teaspoonful four times a day. | | | | |

When removal is impossible, extra care must be taken to guard against chilling the surface of the body.

4. SPASMUS GLOTTIDIS.

Synonyms.—Spasm of the glottis; laryngospasmus, Stimmritzenkrampf; laryngismus stridulus; spasm of the thyroid and crico-arytenoid muscles, thymic asthma.

Etiology.—Rachitis and hereditary influence undoubtedly play the most important parts, but teething, poor nourishment, overcrowding, and bad hygiene act as exciting causes. More boys than girls are attacked (K.). It has been experimentally proven that craniotabes, not so much from the increased compressibility of the softened occiput as from the secondary hyperemia of the cerebral membrane, is a frequent cause of spasm of the glottis. Indigestion and dyspeptic complications frequently bring on single attacks, which are easily reproduced by coughing, fright, or continued fretting. But here we must make a careful distinction between the voluntary "holding of the breath" of spoiled children, who often scream until they become blue in the face, and true spasm of the glottis. The differentiation is easily made by means of a brisk spanking or throwing a little water in the face of the unruly child.

Symptoms.—The first onset generally appears without warning; subsequent ones are noticed to be preceded by short, whistling inspirations, followed by a suffocative attack, during which the child holds its breath, clutches at its throat, and bends its head backward until the eyeballs protrude and the jugulars swell. The face becomes suffused, the mouth half opens, and the whole expression one of great alarm. Such an attack usually lasts about a minute, and probably never more than one, though unless timed it appears much longer. It terminates in a series of short, whistling inspirations, followed at first by noiseless superficial expirations, which latter grow deeper until normal breathing is resumed or another attack appears. These attacks are often followed by an involuntary discharge of urine, or feces, and for a time the pulse is irregular, but in the intervals between the attacks the child appears perfectly well; or this is true until the attacks become very frequent and leave the child at last peevish, weak, sleeping badly, without appetite, and, in consequence, gradually losing flesh.

Prognosis.—Fair, although the child may die in the first or any subsequent attack. Nevertheless, unless the child is very young, it somehow manages to pull through except when bronchopneumonia intervenes, as not infrequently happens. Increase in the number of attacks per diem is an unfavorable sign, for they may reach forty or more in a day, and such increase generally joins a true eclampsia to the spasm of the glottis. Twitching of the facial muscles, balling the thumbs, flexion of the upper extremities, and rigidity of the lower, opisthotonos, etc., betoken these mixed forms, which are far more dangerous than simple spasm of the glottis.

Treatment.—*Prophylactic.* Children in neurotic families should, if possible, be nursed until their first six teeth are cut. Craniotabes always require anti-rachitic treatment (see page 63) and cod-liver oil. *Medicinal.* Almost everything in the way of antispasmodics and neurotics has been tried for the relief of these attacks with very little gain, unless it may be from a combination of bromids and chloral hydrate, such as is advised in eclampsia. German physicians and negroes advise the hanging of a bag of camphor about the child's neck. Nearly two hundred years ago

Underwood discovered the great value of fresh air in the treatment of these cases. Tobacco smoke may be used as advised by him as a last resource for the relief of these spasms, and the writer bears cheerful testimony to the great value of keeping the child out-of-doors as much as possible, for the overheated foul air of a tenement house acts as rank poison upon laryngospasmodic children. Tight clothing should, of course, be removed, a warm bath is often of service, and whiffs of chloroform may be cautiously used when absolutely necessary.

5. FOREIGN BODIES IN THE LARYNX.

Etiology.—It not infrequently comes to pass that children, from the same reasons that impel them to place various things in their noses, eyes, or vagina, place similar articles in their mouths, and then by aspiration draw them into the trachea instead of swallowing them, as was purposed. Such accidents are not infrequent with beans, peas, cherry pits, almonds, candies, pennies, tacks, corks, etc.

Symptoms.—Violent coughing and suffocation with cyanosis attend the entrance of a foreign body into the larynx, and if it remains, an irritating cough persists with subsequent inflammation and ulceration of the trachea. Should the substance be carried deeper, we may be able to perceive its irritating motion as an audible gurgling sound, to and fro with each respiration. Or if it is lodged fast, as might happen with a sharp bit of bone, it produces localized ulceration, indicated by a cough attended with bloody or purulent sputa. Should the body be drawn still lower down into the smaller bronchioles, it may lead either to atelectasis of that portion of the lung (page 20) or to pneumonia.

Course.—Some of these foreign bodies, as needles, may migrate to other parts of the body, or they may result in abscesses, or more rarely become encapsulated. Small, soft bodies, like bits of meat, may be thrown out by violent coughing, or if soluble, like candy, may be dissolved.

Prognosis.—Generally unfavorable if the foreign body has passed within the vocal cords, or if the body is too large to be coughed out or dissolved. An insoluble foreign body inspired into

one of the lesser bronchioles leads almost inevitably to death, as there is no operative or medicinal measure that can be safely used for its removal.

Treatment.—If the foreign body lies above the vocal cords, its extraction should be attempted as speedily as possible with the aid of the appropriate instruments, or if these are not at hand, by holding the child by its heels, head downward, and encouraging coughing by slapping its back or tickling its fauces. When the offending substance has gone deeper, we must resort first to forcible expiration following long-drawn inspirations (forced coughing) and emetics, the promptest of which is apomorphia ($\frac{1}{2}$) or turpeth mineral (gr. j pro dosi). Tracheotomy is called for when the object can be localized, and is usually successful.

6. EDEMA GLOTTIDIS.

Synonym.—Edema of the glottis.

Etiology.—A symptom attending various lesions of the larynx, such as burning with hot steam, etc., or as a dropsical complication occurring in phthisis, nephritis, typhoid, cancer, or other tumors in the neighborhood of the larynx. The laryngoscope shows in such cases an inflammatory edema of the mucous membrane of the glottis and of the false and true vocal cords.

Symptoms.—In the first class of cases, after the initial pain of the lesions inflicted upon the mouth, pharynx, and larynx have been assuaged, increased hoarseness and painful breathing betoken oncoming laryngeal stenosis. Dyspnea soon becomes frightful and often produces death unless help is speedily rendered.

Treatment.—Intubation is clearly indicated in the first class of cases, tracheotomy in the latter is justifiable. Puncture of the edematous tissue is possible in the hands of an expert, but cannot be recommended ordinarily for the larynx of an unruly child.

7. NEW GROWTH IN THE LARYNX.

Varieties.—Pedunculated papillomata, more rarely cysts, congenital syphilitic lesions (congenital hoarseness), adenoid growths, as sequelæ of true croup, pertussis, measles. Differentiation is

only possible by the use of the laryngoscope, with infinite patience on the part of the expert.

Symptoms.—Hoarseness is absent only when the papilloma is located elsewhere than near the vocal cords, *e.g.*, on the glottis, which rarely occurs. This hoarseness often increases until there is complete aphonia. As the growth increases in size there is increased difficulty of breathing, and if the growth becomes caught between the cords there are attacks of suffocation, resembling those of croup, which may terminate in death. Tumors which are located higher may often be detected by pressing down the root of the tongue with a spatula, or tongue depressor.

Adenoid growths are not infrequently coughed up in broken bits, though such are more frequently swallowed by young children.

The progress of these growths, of course, varies greatly with their nature, sometimes a couple of years elapsing between the beginning of the hoarseness and the symptoms of suffocation.

Prognosis.—Never very good. The older the child the better its outlook. Some of these children by the aid of cauterization and the help of intubation tubes make a fight for existence for years, and possibly finally recover.

Treatment.—Entirely surgical and local. Desperate cases demand the opening of the trachea and the removal of the growth after tracheotomy. Less pressing ones will admit of local cauterization (galvano) and the use of the intubation tubes *p. r. n.*

8. PARALYSIS GLOTTIDIS.

Synonyms.—Paresis of the glottis ; Stimmbandlähmung.

Etiology.—Its origin may be either central, *e.g.*, tumor at the base of the brain, when the paresis is always bilateral, or it may arise from peripheral nerve pressure on the vagus, or recurrens, etc., which not infrequently occurs from caseous glands and is only bilateral when the cause is located on both sides of the neck. Again, this form of paralysis may follow diphtheria.

Symptoms.—The first thing usually to attract attention is a feverless, noisy respiration, not unlike that of croup, but without difficulty and more rattling. Deep breathing, crying, laughing,

etc., provoke attacks of violent coughing. The voice is always hoarse, or if there is bilateral paralysis, aphonic. The laryngoscope makes the diagnosis sure according as one or both of the vocal cords fail to recede during inspiration, or to approach during phonation. During deep inspiration the chink of the glottis is lessened by atmospheric pressure, and hence the irritative cough.

Prognosis.—If due to caseous glands or pressure, unfavorable. The same is even more so with the brain tumors. Diphtheritic paralysis is more hopeful.

Treatment.—Treat the complicating scrofula if present, and use externally tincture of iodine and electrotherapy. The introduction of sounds and the insufflation of powders into the larynx are also helpful in skilled hands.

If after several weeks there is no improvement under general treatment, we must extirpate the bunches of diseased glands, avoiding carefully the vagus, which has more than once been cut during such operations. After diphtheria, use tonics, as iron, and especially strychnia.

9. STENOSIS TRACHEÆ.

Synonyms.—Tracheal stenosis; Verengerung der Luftröhre.

Etiology.—May be congenital, or follow as the result of struma. More rarely it results from tumors of the thyroid or infiltration of neighboring lymphatic glands. Again it results from change in form, or atrophy of the windpipe, not infrequently due to suppurating lymphatic glands. Or there may have been a previous perichondritis—often of syphilitic origin. Or chronic congestion of the tracheal mucous membrane by extension from similar affections of the larynx, catarrh, croup, diphtheria, etc., may produce this lesion. Sometimes it is due to the introduction of foreign bodies into the trachea, more rarely to tracheal polypi. Strangulation of the windpipe with narrowing at the point of the angle may result from a pleuritic exudate, and contraction of the lung on the affected side.

Symptoms.—The *congenital* form shows itself by the impeded respiration and difficult nursing arising therefrom. No cyanosis, but weak and hoarse voice. The *acquired* variety manifests itself by croupy breathing. Sometimes the narrowing, or strangulation,

may be felt just above the sternum, and when such deformity results the respiratory sounds on the affected side will be found diminished.

Treatment must be directed to the cause; if due to swollen lymphatics, syphilis, or scrofula, our main reliance must be placed on the internal and external use of iodine, conjoined in the first case with cod-liver oil. Compressed air has at times been of value. Polypi must, of course, be removed.

10. DISEASES OF THE THYMUS GLAND

are rare in children, and if confined to one side have no influence on respiration, hence the so-called thymic asthma is a misnomer.

Caseation of the thymus is its most frequent disease in childhood, usually with similar implication of neighboring bronchial glands. Abscess of the thymus is occasionally met with in syphilitic children, in whom the disease produces a change in the secretion of the thymus from acid to alkaline reaction. Even more rarely cysts or carcinoma of the thymus have been noted, but usually their nature has not been recognized before the autopsy.

Treatment.—Operative only.

11. DISEASES OF THE THYROID.

Hypertrophy of the thyroid is usually acquired, and manifests itself after the second dentition. When it reaches its highest manifestation it produces the so-called *thyroid asthma*, caused by tracheal stenosis, resulting from the pressure of a cystic or adenoid thyroid gland, and differing in none of its symptoms from those observed in the adult from a similar cause.

Congenital bronchocele appears endemic in certain localities and among certain families, reference being made here only to the adenoid variety, in which the gland embraces nearly the entire trachea like a ring. These children are often born apparently dead, and when they can be resuscitated, breathe superficially, irregularly, and without noise. Death from asphyxia often follows quickly after birth in such cases.

Treatment in congenital forms must be directed to the relief of

asphyxia, for it is possible thus we may obtain relief in the course of a few weeks by the aid of forced inspiration, good wine, fresh air, and warmth.

Other forms of bronchocele have been helped by painting with tincture of iodine once or twice a week, the possibility of later phthisis being always kept in mind in the treatment of these cases.

Latterly the attempt has been made to prove that *cretinism* is due to torpor or atrophy of the thyroid. Hence in such cases if we follow Horsely's advice we shall endeavor to restore the loss of function of the thyroid body. Schiff suggests that this may be done by transplantation of a thyroid from one of the lower animals. Desiccated thyroid glands from the sheep or a glycerin extract of the same are just now the popular fads in the treatment of myxedema and cachexia strumipriva, but more time is required for certainty as to their beneficial results.

DISEASES OF THE LUNGS.

1. ACUTE BRONCHITIS.

Synonyms.—Bronchitis catarrhalis; Luftröhrenkatarrh.

Varieties.—Acute, subacute, or chronic; due to a general or localized hyperemia, with all degrees of secretion resulting therefrom, even deficient, giving rise to the so-called *bronchitis sicca*.

Pathology.—According to Hamilton, the anatomical changes of acute bronchitis are always the same whatever may have been its cause. The first microscopic change evident is a relaxation and distention of the abundant network of blood-vessels distributed through the inner fibrous coats of the bronchioles. Following this the basement membrane becomes thickened and edematous, though not uniformly so, for its inflammation occurs in patches, limited in extent, often confined to the tubes of large caliber only. In twenty-four to thirty-six hours the columnar epithelium becomes loosened and desquamates in patches, this desquamation constituting part of the early catarrhal discharge in the stage known as *tight*, which is followed by more profuse secretion from the deeper epithelium so soon as they are freed from the overlying columnar. This with mucus constitute the sputa.

Etiology.—The usual effect of extreme cold, excessively dry or dusty air, is to produce hyperemia of the bronchi, hence bronchial catarrhs are especially frequent in winter, also in summer in large cities from the dust flying at that time in the streets or squares which have not been properly watered. The same holds true of the poorly ventilated rooms in which many of the poor are compelled to live, which are always provocative of bronchial catarrh. Like results are often observed during the dentition of children (tooth cough), due to the excessive salivation at that time and the consequent wetting of the chest. The children of tubercular parents are especially liable to these attacks. Such children give early evidence of nasal catarrh (snuffles), whose extension from the nasal cavities to the pharynx, larynx, and bronchial tubes is a matter of frequent occurrence.

Bronchial catarrh is an invariable accompaniment of measles and typhus. In variola, pustules form upon the tracheal and bronchial mucous membrane, with resulting bronchial catarrh. The etiology of the recently named *autogenetic* bronchial catarrh is a subject well worthy more extended study than has yet been given it. It can, however, be safely stated that many morbid conditions of the body produce within it a toxic substance or substances, whose excretion through the bronchial mucous membrane gives rise to a specific catarrh. A case in point is the so-called hypostatic pneumonia of typhoid, undoubtedly produced by the irritative effect of typhoid ptomains, or leucomains, excreted in part through the bronchial mucous membrane, as it is well known happens in measles and asthma.

Symptoms.—The most invariable symptom is cough, not increased by lying on the back as compared with a lateral posture, but intensified by sitting upright (K.). At first the attacks of coughing are violent; but with increased secretion, the sputa become looser and hence easier to cough out, although sleep is yet frequently disturbed by coughing. Older children complain of a weight beneath the sternum and a girdle-like pain across the diaphragm, and the disposition of such children is often changed at the same time. They become peevish, unruly, and easily provoked. Fever is, as a rule, moderate (102°–103° F.). The sputa

with a young child is rarely seen, since it is swallowed as soon as raised; but if it is necessary to examine it, sufficient may be obtained by the tip of the doctor's finger carried well back over the child's tongue during coughing. In the early stages the sputum will be found to be grayish-white and full of air bubbles; later it becomes thicker, yellowish-white, and if the coughing has been violent may be streaked with blood. If the larger bronchial tubes only are involved, respiration is not greatly disturbed, or only slightly quickened (30-40 p. m.), but if all the bronchioles are attacked (bronchitis totalis, capillary bronchitis, catarrhal pneumonia), then respiration becomes very difficult, and deficient oxidation results. This is shown by the dilation of the *alæ*, cyanosis, and other symptoms of approaching death from asphyxia. Gravitation of the thickened secretions and plugging of groups of air cells by deep inspiration after violent coughing may produce lobular pneumonia, or secondary atelectasis.

Examination by percussion, notwithstanding niceties of differentiation laid down in the text-books, is generally unreliable. The best results may be obtained by *palpation*, which most children submit to with the best grace, and by which the examiner may locate large accumulations of mucus in the larger bronchial tubes, the râles produced by thickened secretions in medium-sized tubes, and the purring crepitation of capillary bronchitis.

Auscultation always reveals vesicular breathing, with large and fine ronchi, and if capillary bronchitis be present, crepitation as well, unless it be masked by larger and coarser râles. Respiratory sounds entirely disappear for the moment, when a bronchus is completely filled with tough mucus, but so soon as a deep inspiration is taken they reappear.

Prognosis.—Unless there is a persistence of the exciting cause, in previously well children an acute bronchial catarrh ought not to last more than a week. Of course, if the exciting cause persists the duration of the bronchitis is longer, and with children of consumptive parentage may persist for months or years with alternate improvements and relapses until death.

If extensive caseation of the bronchial glands has taken place, then no improvement in the bronchial catarrh can be hoped for,

since the bronchial mucous membrane has become hypertrophied with fibroid proliferation and ectasis; later pulmonary phthisis.

Hence we may say that in healthy families the prognosis is good; in consumptives always a source of anxiety, although there may have been previously recoveries from mild attacks of catarrh.

Prophylaxis is often more important than other treatment, especially in tubercular families. During dentition such children should always be provided with waterproof bibs to prevent wetting and chilling the neck and chest. If possible, these tubercular children should be provided with a healthy wet nurse and should always have an abundance of pure, fresh air, and in winter should be guarded from the raw, cold northeasters, and not allowed to play upon the floor or on window seats, which are always several degrees cooler than the rest of the living rooms. Repeated attacks of bronchitis require that an attempt should be made to lessen the susceptibility of the child by means of tepid salt-baths just before sleep, the wearing of flannel next to the skin, and cold sponging of the neck and throat on rising, etc.

Change of climate is very desirable for many of these cases, selection being made of such localities as promise the least variations in temperature and the largest opportunity for an out-door life, pine forests being especially desirable.

Treatment.—Whenever possible, there should be prompt removal from all exciting causes, as, for instance, dusty or illy ventilated rooms. Expectorants, as ipecac, with the citrate of potash or bicarbonate of soda, may be employed to liquefy viscid secretions (see R. page 89), or if there is great distress for breath, resort may be made to emetics, as powdered ipecac, turpeth mineral, fl. ext. of quebracho. To quiet the hyperesthetic mucous membrane, narcotics, such as codein, syrup of lactucarium, or cherry laurel water, may be cautiously employed (R. No. 14), or soothing sprays may be utilized in a steam atomizer. Recurrent catarrh in phthisical children should be guarded against as far as possible by the use of cod-liver oil, syr. ferri iodid (gtt. x t. i. d.) and quinin (tannate in chocolate), avoiding with the greatest possible care all sudden changes in temperature.

2. PNEUMONIA CATARRHALIS.

Synonyms.—Catarrhal pneumonia; pneumonia lobularis.

Definition.—Secondary extension of an acute bronchitis into the smaller bronchioles, where it may run an acute or chronic course.

Etiology.—In general bronchitis with copious secretion it often happens that mucus may be drawn into the alveoli, especially upon deep inspiration, or after violent paroxysms of coughing, as in pertussis. Persistent lying on the back is a frequent cause of the same accident, and hence it happens that catarrhal pneumonia is usually bilateral and is an exceedingly frequent complication of measles, pertussis, or of bronchitis, occurring in rachitic children, more rarely so in the scrofulous.

Symptoms.—The onset of this disease is not usually well marked, because acute bronchial catarrh has previously existed and simultaneously points of inflammation from the size of a pea to a cherry may be found scattered through the lungs. With these all the previous symptoms become worse, pulse and fever slowly rise, but never reach the same height that they do in croupous pneumonia.

Respiration becomes labored, often interrupted with sighing and followed by general unrest. Temperature in a few days reaches 102° – 103° , or even higher, but with well-marked morning remissions, and falls just as gradually as it rose (3–10 days) until it again reaches normal.

Auscultation, to the well-trained ear, gives, in addition to the catarrhal sounds which previously existed at various points, crepitation and rhonchi. More rarely and less clearly marked are bronchial breathing and bronchophony, on account of the small area of the spaces affected.

Percussion generally yields only a tympanitic note or the amphoric tone. Well-marked dullness can only be detected in case of large extension of these areas of lobular pneumonia, and then seldom can be relied upon.

Prognosis.—In general is less favorable and the disease of longer duration than croupous pneumonia. The younger the child the worse the prognosis. The mortality of catarrhal pneumonia

after measles is about 33 per cent., that of pertussis below one year nearly 50 per cent. Nurslings generally succumb from deficient oxidation of the blood, as shown by the pale skin, cold sweat, and general collapse; or they die directly from asphyxia. With children, and especially after measles, it runs a more acute course, but in tuberculous or scrofulous families, or where there is a persistence of the cause (pertussis), the disease often becomes subacute or chronic. In the latter there is a typical fever which persists for weeks, or so long as the infiltration is unresolved, which infiltration becomes transformed into either fibroid induration with emphysema, or passes into pulmonary phthisis.

Treatment.—If, in spite of what has already been directed in the way of prophylaxis, fever appears during the course of a subacute bronchitis, we should endeavor to reduce temperature by means of safe antipyretics, such as phenacetin, cold baths, or packings, and the free use of lithia water.

When properly managed, large, warm flaxseed poultices often afford great relief, but where the nursing cannot be depended upon, we should rely upon cotton-wool, or oil-silk jackets. Ammonia carb. and digitalis are of real value in threatening capillary extension, especially if associated with minute doses of strychnia or tinct. nux vomica, *e. g.* :—

RESPIRATORY STIMULANT.

(50).

| | | |
|----|----------------------------|------------|
| R. | Ammon. carb., | 4 gm. |
| | Syr. scillæ, | 12 c.c. |
| | Tinct. digital., | 4 c.c. |
| | Aquæ camph., | 44 c.c. M. |

SIG.—One quarter to one teaspoonful as required.—M. P. H.

Deficient oxidation calls for the prompt administration of caffeine or quebracho. If the disease runs into a chronic condition, our chief reliance must be put upon good nourishment and country air. Tardy resolution may be assisted by the inhalation of medicated vapor and the internal use of potassium iodidi (gr. ij. t. i. d.). Bronchorrhea may be relieved by emetics and irritating cough by small doses of some opiate, preferably codeia, or appropriate doses

of the syrup of lactucarium (Aubergier). Appropriate clothing and salt bathing will do much to prevent relapses.

3. ATELECTASIS PULMONUM ACQUISITA.

Synonyms.—Acquired atelectasis; apneumatosi.

Etiology.—Always as a secondary result of the compression of the lung, and hence most frequently met with in the rachitic thorax. More rarely arises from pleuritic exudates, scoliosis, kyphosis, or from any enlargement of the organs of the thorax or from a foreign growth located therein. In this connection it should be remembered that the rachitic chest not only suffers from arrested development, and hence is smaller than normal, but it also happens that the weakened ribs are pressed inward by atmospheric pressure during each inspiration, so that the capacity of the thorax is still further diminished and *pari passu* the pulmonary tissues are unduly emptied of their blood and acquire a flesh-like appearance (carnification) in place of their normal spongy tissue. Under a continuance of this pressure the walls of the alveoli disappear and the parts of the lung thus compressed are transformed into a rind or cortex—see Atelectasis Pulmonum, p. 20, whose boundaries are fixed only by the cessation of its exciting causes (*e. g.*, the disappearance of a pleural exudate, etc.).

Symptoms.—The natural result of diminished lung capacity is quickened respiration, often accompanied by a mild degree of dyspnea. At first auscultation gives crepitation, later on bronchial breathing similar to pneumonia, but from which atelectasis may be distinguished by its lack of fever. Percussion rarely yields a clearly marked dullness, for the reason that the atelectic area is generally of very limited extent.

Prognosis is always unfavorable, though it is possible that if causal rachitis can be relieved we may hope for a cure of the atelectasis as well. Its course is always chronic, like its underlying causes. With incurable rachitis, the disease coincidentally grows worse, frequently producing most distressing dyspnea, and death occurs after weeks of exhausting bronchorrhea.

Treatment.—Chiefly that of the primary disease, endeavoring at the same time to provide the most nourishing food in the hope

of increasing the activity of the respiratory muscles. Mountain air is of especial value in these cases. Where pleurisy complicates, aspiration, or an operation for the removal of the pleuritic exudate is clearly indicated, and the usual treatment for the relief of bronchial catarrh.

4. NIGHT COUGH.

Etiology.—Rarely, if ever, except the malarial variety, met with in otherwise sound children. Usually betokens enlargement of the bronchial glands, with underlying hereditary tuberculosis.

Symptoms.—Every night, usually about the same time, the child suffers from one to two hours with a violent, dry cough, from which it is exempt during the day. This condition of affairs lasts for months and is then followed by the other symptoms of incipient tuberculosis, page 107.

Treatment.—According to Vogel, narcotics are useless in these cases, though trial should be made of chloral. Kormann recommends full doses of iron and quinin, with the general treatment already given for suspected tuberculosis.

5. PNEUMONIA CROUPOSA.

Synonyms.—Croupous pneumonia; pneumonia lobarus.

Etiology.—More rarely met with in children than in adults, and much more infrequent than catarrhal or lobular pneumonia during childhood. It may, nevertheless, occur *in utero* as a sepsis (see p. 23), originating in the mother or in the new-born as a sequela of pyemia or sclerema. In older children it usually comes without a sufficiently proven cause (Friedlander's micrococcus?), although epidemics are frequent, such epidemic being accompanied, according to Kormann, with an unusual prevalence of membranous croup. The blame is often laid to cold, and one attack increases the liability to a second.

Symptoms.—In nurslings we may expect to find—as in all other serious interference with respiration—the frequent letting go of the nipple for breath and rapid breathing and groaning. Convulsions usually take the place of the chill observed at the

onset of a pneumonia in an adult, and relapses are by no means rare in infants.

Older children present the same symptoms as adults, but the diagnosis of croupous pneumonia in such is rendered difficult by the absence of the characteristic rusty sputa, and crying often marks the physical signs of pneumonia during auscultation. As a rule, the onset is sudden, beginning in young children with shivering or convulsions, with high temperature, 103° – 105° , in older children, with a distinct chill, and in every case, except the pneumonia of sclerema, with rapid elevation of temperature and high pulse rate. At the same time respiration becomes labored, the face is slightly cyanosed, and the *alæ* of the nose dilate with each respiration. If at the same time there are pleuritic pains, respiration becomes superficial and irregular, and in such cases the child is unwilling to lie on the affected side, while in uncomplicated pneumonia the child prefers to lie on the affected side, and in order to restrict as far as possible painful movements of the thorax, the child lies curled up with the spinal column concave toward the affected side. The cough is always short and choppy and generally attended with pain.

Until the fifth to seventh day the fever keeps at an undeviating high temperature, and there is continued exudation into the alveoli, with the production of the so-called red hepatization. This filling up of the lung with a croupous exudate, which it is impossible to expand by inspiration, limits greatly the motion of the chest walls, and brings as a result cyanosis to a greater or less degree. By auscultation we obtain bronchial breathing during the stage of hyperemia, but when resolution begins fine vesicular râles.

Percussion gives, when hepatization is complete, marked dullness over the affected spots, unless, as is rarely the case, the hepatization is central only. More frequently with central hepatization we have at first a tympanitic note over the affected spot, but in from two to five days later, dullness in the same location from the extension of the hepatization to the pleura. At the commencement of resolution the percussion note is again tympanitic, and sometimes, from conjoined partial resolution and partial infiltration, we may hear the amphoric note (cracked pot). Herpes labialis and facialis are frequent attendants upon

croupous pneumonia, with which we may also have alarming cerebral symptoms, which may make the diagnosis difficult at first. These are the cases in which the apices of the lungs are first attacked and begin with vomiting, loss of consciousness, delirium, stupor, convulsion, immobility of the pupils, etc., all largely due to the height of the fever, as croupous pneumonia is rarely complicated with true meningitis.

Course.—Croupous pneumonia runs its course more rapidly with the child than in the adult. The fever, at first high with very slight morning remissions, generally falls with the general declension of the inflammation on the seventh to eighth day; or if small in extent, this may occur on the fourth day, or we may say on the fifth as an average, when within twenty-four hours crisis occurs. The temperature suddenly falls to normal, or even subnormal, though, as with adults, this normal subsidence of the inflammation may be interrupted and the process delayed for a day or two longer. Crisis sometimes ushers in a collapse in which the patient expires, the temperature again rising in the death agony, even though the thermometer may have fallen at the beginning of crisis. If crisis is complete, the pneumonitis has subsided and resolution begins partly by absorption and partly by expectoration of the fatty degenerated exudate, now liquid and in the condition of so-called yellow hepatization. But even yet alarming cerebral symptoms may make their appearance as the result of anemia of the brain. These are delirium, hallucinations, coma, and amaurosis, anemia of the retina, as may be proven by the ophthalmoscope.

Differentiation.—The differentiation between catarrhal and croupous pneumonia in the child is not always easy from the physical signs, but we may be assisted in this by remembering the bronchitis which precedes catarrhal pneumonia as contrasted with the sudden onset of the croupous variety. The temperature of the latter is higher than that of the catarrhal form, which is a disease without crisis, which occurs in croupous pneumonia on the fifth to seventh day with a sudden fall in the temperature of from three to five degrees.

Prognosis.—Lysis occurs more rarely with children than the complete crisis just described. When the former occurs it is accompanied by a gradual decline of fever, partial resolution of

the exudate, and often a drifting into chronic pneumonia. Hence it happens that caseation of the lungs, or fibroid phthisis, is more rarely met with in children after pneumonia than with adults. The mortality with children varies greatly, but may be said to range from 5 to 25 per cent. In general it may be said to be better than for the adult, but it must be remembered that when for any reason resolution is delayed and the exudate is for days or weeks, partly expectorated, partly swallowed, partly reabsorbed, intestinal disorders follow, and in the case of nurslings may ultimately lead to death from malnutrition.

Complications, as may be inferred, are most frequently a bronchitis of the sound lung, caused by collateral congestion, or lobular pneumonia in addition to the croupous, or a pleurisy with exudate, and diarrheas. Death results either from the height of the fever or from extension of the inflammation and fatal asphyxia, or from heart failure.

Treatment.—It should always be remembered that croupous pneumonia is in the child, as in the adult, a self-limited disease, not to be aborted or greatly shortened by any medication. The fever in a nervous child may require control, lest its hyperemia produce convulsions. In such children a temperature above 103° is very liable to produce an eclamptic attack, and hence it is justifiable with such to reduce the initial fever of pneumonia with some safe antipyretic to below the danger line. Tepid baths, cold packing, or the cautious use of antipyrin may be necessary to accomplish this. Expectorants are never of value in the congestive stage of croupous pneumonia, as they can accomplish nothing in the way of resolution, and the fluidity of the pneumonia secretions can be better preserved by the free use of lemonade or cold water without the nausea and anorexia produced by the ordinary expectorants. Next to the free use of cooling drinks a large, well-ventilated room—preferably by means of an open fireplace—is a godsend in the treatment of pneumonia in children, which needs little if any medication. Niemeyer strongly advises the use of ice bags to chest during the onset of pneumōnia, but efficient as this has proven with German children, they are illy borne by the American child, with whom the annoyance of the cold more than counterbalances the good attained by its use.

For feverishness, restlessness, and hot, dry skin, divided doses of aconite in tablet form often give relief, and if there is fever small doses of phenacetin prove a valuable adjuvant. Purgatives are depressing and laxatives should be given only as they are positively required. Poultices may relieve pleuritic pain and do no harm if kept warm, but in croupous pneumonia the cotton-wool and oil-silk jacket is preferable, because it requires less care and is fully as efficient. The great danger in croupus pneumonia lies in heart failure, for the right side of the heart is kept constantly surcharged with blood in the ineffectual effort of the heart to carry the blood through the congested lungs, hence nitroglycerin and the preparations of belladonna are theoretically indicated for this emergency. For continued use the writer prefers caffein (gr. ss-j every four hours), remembering that caffein may produce a condition resembling delirium tremens in the young child. Alcohol, if not given too early, has helped many a pneumonia over crisis, and strychnia is an excellent heart tonic.

If bronchitis attacks the sound side apply poultices and use the treatment elsewhere recommended for acute bronchitis.

(c) For the delirium of cerebral anemia give freely wine, beef juice, expressed with a lemon squeezer, and nourishing soups. Coffee and cream ad lib. Alcohol when septic.

(d) To hasten expectoration nothing has yet been found more reliable than the free use of the alkaline carbonates, or a muriate ammonia mixture.

| | | | |
|----|------------------------------|--------|----|
| R. | Ammon. muriat., | ℥ ij | |
| | Aquæ anisi, | | |
| | Glycerinæ, | ℥ ss | |
| | Syrup glycyrrhizæ, | ℥ iij. | M. |

SIG.—One-half teaspoonful every two hours.—H.

(e) For pleuritic pains sinapisms and small doses of morphin. Large, warm poultices give speedy relief for pain, and phenacetin will often bring sleep when opiates only excite.

(f) For tardy convalescence change to the country, iron, and good food. For the diarrhœa, tannate of quinine or saccharated ext. coto can be highly commended. And every pains should be

taken to bring about entire recovery, for unresolved pneumonic deposits are a fruitful source of bronchial adenitis, night cough, and miliary tuberculosis, which see.

6. EMPHYSEMA PULMONUM.

Synonyms.—Emphysema of the lungs; Lungenbronchiektasis.

Varieties.—May be congenital, or be produced during the act of birth, as, for instance, by too forcible inflation of the lungs of a child born asphyxiated. Pulmonary emphysema, as a rule, in children is only partial or localized, being vicarious or supplementary; hence is a secondary result of those diseases of the chest which diminish its respiratory capacity, such as unresolved pneumonias, pleuritic exudates, or those diseases which are accompanied by violent cough (pertussis, etc.), whose tendency is to distend the alveoli in the unaffected parts of the lung. (In pertussis this pressure is doubled upon both sides, so that air may be forced into the intercellular connective tissue, and thus give rise to what is known as *interlobular* emphysema). It should also be remembered emphysema may occur in feeble and atrophic children without previous pulmonary disease. Dilatation of the bronchioles in children is generally cylindrical instead of pouch-like. (K.)

Symptoms.—So long as the original pulmonary trouble persists, the secondary emphysema presents no noticeable symptoms; but if after the recovery of the primary trouble there is persistence for a long time of dyspnea and pulmonary engorgement, cyanosis, and dilatation of the right heart, we may well turn our attention to the existence of emphysema.

Prognosis.—Emphysema in a child's lungs may make perfect recovery if the original disease is cured or the paroxysms of coughing can be quieted and the exciting general atrophy removed. In such cases the alveoli will regain their contractility and the air spaces return to their original capacity.

Treatment.—In the main, looking toward a general supporting of strength, cutting short the original disease, and good air, with inhalations of soothing vapors, such as those containing oil of Scotch pine in some alkaline liquid. Cream, liquid peptonoids,

and cod-liver oil are of great value in building up the general condition of the child, while the electric current may assist the action of the enfeebled respiratory muscles. Syrup of lactucarium or codeia for cough.

7. PLEURITIS.

Synonyms.—Pleurisy; Rippenfellentzündung.

Etiology.—A child may be born with septic pleurisy which has originated in utero as a result of the transference of puerperal poison from its mother during the latter part of pregnancy, or she may later infect the new-born (during epidemics of puerperal fever in lying-in wards), or it may occur in the form of pyemic pleurisy as a result of phlebitis umbilicalis, etc. Intraparietal pleuritis may also be met with as a primary affection (rheumatic) or more frequently as a secondary complication in various lung diseases, as, for instance, in catarrhal or croupous pneumonia, or after hemorrhagic infarcts, as adhesive pleurisies (*pleuritis sicca*). Even oftener phthisis produces a pleurisy, where we find either the adhesive or exudative forms of pleurisy. Exudative pleurisy in phthisis is very prone to take on the purulent form (empyema) and become chronic. Pleurisies also occur, though less frequently, during the course of the acute infectious diseases, and pyemia and scurvy.

Differentiation.—Ought not to be difficult to the physician who is called in time to note the characteristic pain on inspiration, and the friction sounds of early pleurisy. Unfortunately, he is often not called until this stage has passed, and he has nothing for his guidance but an obscure history of pain and localized dullness in the chest. Later the effusion may be sufficient to give complete loss of fremitus, immobility of the affected side, and woody resistance to the percussing finger, making diagnosis easy, though all these often escape detection for weeks, if through mistaken kindness to the child the test of the hypodermic syringe is neglected.

Symptoms.—Children attacked with congenital pleurisy are either born dead or die, cyanosed, soon after birth. All other forms begin with fever and pain, which soon makes the breathing rapid and superficial. Little children whimper when the affected side is disturbed or when they are set upright. The pain dis-

appears with the appearance of the exudate, but is apt to return a few days later, similarly to disappear. So long as the pain lasts, the child lies on the sound side; after the exudate appears it desires to lie only on the affected side. In adhesive pleurisy it is often possible both to hear and feel friction between the pleural walls. *Percussion* gives negative results, except when phthisis pulmonalis has formed a thickened cortical layer, and then dullness is readily detected over the pleuritic areas.

Inspection gives us various methods of detecting larger or smaller amounts of pleuritic exudate. If the quantity is large, we shall find bulging in the intercostal spaces and deficient respiratory motion caused by pressure upon the lung. If the exudate is located upon the left side, the heart will be found displaced to the right, and generally with children the measurement of the affected side will be found to be greater than the sound one. Clear up to the upper border of the exudate there are no respiratory sounds and no fremitus, but on the border bronchial breathing may be heard, and in some rare cases this may also happen, even if there be exudate, if the lung is bound down by earlier pleuritic adhesions which prevent displacement of the compressed lung. Friction sounds often reappear on the edge of the exudate as it begins to be reabsorbed.

Course.—Adhesive pleurisy leads to a union of the two walls of the pleura, either as a whole or by fibrinous bands. The pleural exudate, whether sero-fibrinous or purulent, may be absorbed in from one to three months, and recovery take place with a fibrinous deposit left behind. Retraction of the thorax with dropping of the affected shoulder, due to scoliosis of the spinal column with convexity to the affected side, and compensatory lumbar distortion, is a frequent result of pleurisy, best seen when standing. This deformity often brings with it permanent atelectasis. In other cases there is an external discharge of pus through the walls of the thorax, usually below the nipple, through a spot previously swollen and reddened before the breaking through of a copious empyema. This is prone to leave a fistulous opening through which pus discharges for years; or it may quickly heal and soon break out afresh. More rarely the empyema discharges into the lung or forms a pulmonary cavity, constituting a pneumothorax, or the

pleural exudate—especially with children—may remain as a thick, caseous layer, which may prove the starting point for future tuberculosis, usually of the acute miliary form.

Treatment.—Allay pain by means of warm poultices, opiates, and, if necessary, cupping. If there is constipation, as is usually the case, give a free dose of calomel and combat fever with cold spongings and appropriate antipyretics. For the removal of the exudate local applications of tincture of iodine—or, better, pigmentum tiglli (see R below), and in obstinate cases conjoin the use of diuretics (infusion digitalis, cream of tartar, spir. juniper, etc.).

CORSON'S PIGMENTUM TIGLLI.—Modified for children.

| | | | |
|----|---------------------------|---------|----|
| R. | Ol. tiglli, | ℥ ss | |
| | Glycerinæ, | ℥ iijss | |
| | Tinct. iodinii, | ℥ iv | |
| | Ether sulph., | ℥ j. | M. |

SIG.—To be applied with a brush to the chest night and morning until pustules appear. II.

If convalescence is tardy, in otherwise favorable cases, recourse must be taken to good air and the best of nourishment, such as fresh milk, beef juice, eggs, and cream, etc. An assured diagnosis of empyema or pressing dyspnea in any pleurisy justify resort to aspiration, and if need be to paracentesis thoracis, or even a simple incision, if the empyema threatens to break through the chest walls, always tapping first with a clean hypodermic syringe to make certain your diagnosis.

Prognosis of primary pleurisy is fairly good, even then we must expect tedious recovery. Secondary pleurisy less hopeful, as there is usually an underlying tuberculosis. Septic pleuritis is very fatal.

8. PNEUMONIA CHRONICA.

Synonyms.—Scrofulous or chronic pneumonia; phthisis pulmonum; Lungenverkäsung. (See Tuberculosis.)

Definition.—One of the manifestations of hereditary tuberculosis, where its description properly belongs.

Etiology.—Hereditary, often manifesting itself in the first year of life either as a chronic pneumonia, or it may develop from a

scrofula due to poor nourishment and the bad air of great cities. Again, measles, pertussis, or syphilis frequently precede this affection. In general, it does not make its appearance until after the first year,—in fact, much less frequently in the first year than after the twenty-fifth year.

Whether in any individual case the disease begins as a miliary tuberculosis, originating from an embolism due to previously existing suppurating points and terminating in pulmonary tuberculosis, or whether we have to do in the beginning with a case of caseating pneumonia, is often a very difficult question to answer.

Pathology.—The autopsy in such cases shows either miliary tuberculosis of the lungs or their caseation, both of which may be diagnosed by means of the tubercular bacilli or bits of caseous lung found in the sputa.

Symptoms.—Usually immediately after a catarrhal pneumonia, or more frequently after measles or pertussis in scrofulous children, we fail to get desired resolution. Either the infiltration remains unchanged or increased in extent, or fresh deposits take place, and finally these exudates become transformed into a thick, cheesy mass, or suppurate, breaking down with them the infiltrated lung tissue. At these points of infiltration we may find the evidence of localized pneumonia with coincident pleuritis, often with adhesions. If, however, the infiltration is centrally located and the physical signs fail, we must rely for our diagnosis upon general symptoms, such as the blanched skin, bluish conjunctivæ, wasting and chronic cough, hectic and sweating.

It should be remembered that scrofulous pneumonia in children may begin anywhere in the lungs. There are, of course, a small number of children with whom, as with the adult, the process begins with an induration, caseation, and the formation of a cavity at the apices of the lungs. (These are usually sequelæ to apical croupous pneumonia.) Cough is a marked and persistent symptom, such children becoming used to coughing, and expectorating freely and hopefully. Only rarely streaks of blood are mixed with the expectoration, but very frequently elastic fibers and pus corpuscles may be found with the microscope in the sputa. At this stage of the disease the bronchial glands are always enlarged, and frequently infiltrated and caseated.

Prognosis.—So long in chronic pneumonia as the fever does not reach a high point and the strength is not greatly prostrated, we are not justified in making a fatal prognosis, for even a protracted pneumonitis may recover, though a tendency to relapse will persist thereafter. The disease, however, usually runs a slow course, with variable, daily alternations of temperature—afternoon hectic, and early morning sweatings, and progressive emaciation and death; but it is possible that very gradual gain in weight may take place, as relative recovery takes place by fibroid induration of the diseased points, one after another. Autopsies made upon such cases, dying suddenly from other causes, as cholera, dysentery, etc., show not infrequently such cicatrized points accompanied by a moderate bronchiectasis. The majority of these cases, however, develop hydremia as the result of amyloid degeneration of the vessels of kidneys, lymphatic glands, liver, or intestines. More rarely hemoptysis occurs from the perforation of a blood-vessel during the erosion of a pleural exudate or the breaking down of the lung into a pulmonary cavity.

Death usually results from septicemia, being preceded by hectic with fever and chill, announcing the ravages of the tuberculosis bacilli in the lungs or throughout the body (general tuberculosis).

Treatment.—Fever is to be controlled as usual by antipyretics, cold baths, and packings, and especially valuable here are full doses of quinin when they are well borne. Such children should have the very best nourishment possible, to which should be added cod-liver oil, or cream when the first causes indigestion. Above all, careful provision should be made for an ample supply of good, pure air, preferably in the pine woods or at a moderate altitude when this is possible, but no locality should ever be chosen unless it is possible there to guard against sudden changes of temperature by means of properly warmed living apartments.

Astringent sprays and the internal use of small doses of alum or the terpene hydrate mixture will do much to diminish excessive secretions. Hyperemia without secretion, but tormenting cough, will be greatly relieved by alkalies and narcotics, preferably chloral or codeia—enough of the latter being used to insure good sleep. Forced respiration and out-door life might save many

of these children, too little attention being given in these cases to pulmonary gymnastics in the hands of a competent teacher, early in the disease.

9. PHTHISIS GLANDULARUM PULMONALIUM.

Synonyms.—Glandular phthisis; Brustdrüsenverkäsung.

Definition.—A localized tuberculosis originating in the bronchial lymphatic glands. (See *Tuberculosis*.)

Etiology, etc.—Is generally an hereditary affection which can be traced back directly to tubercular parents or grandparents. Caseation of the bronchial glands is never a primary disease, but is due to either a primary scrofulosis or to previous inflammation of other organs whose lymphatic current would be carried through the bronchial lymphatics, hence it may arise after chronic pneumonia, chronic bronchitis, broncho-pneumonia, especially that of pertussis, measles, or rachitis, where it often comes to pass that notwithstanding the exciting bronchial catarrh has long ago apparently been cured, inflammation, suppuration, and caseation of the lymphatics have just begun their course.

Symptoms are those usually met with in pulmonary phthisis, with no recognizable pulmonary lesions other than mild bronchial catarrh with slight evening rise of temperature. Sometimes chains of infiltrated lymphatic glands may be detected in the fossa supra clavicularis. These glands and those lying deeper may attain the size of a hen's egg, and thus displace contiguous organs, as the trachea or bronchi, causing in this way dyspnea. Pressure upon the esophagus gives us the symptoms of esophageal stenosis, or if upon the vena cava superior we find turgescence of the veins of the neck, blueness of the face, and slight edema of the lids.

Pressure upon the recurrent nerve increases the attacks of dyspnea, even to orthopnea, cyanoses the face, and produces a rapid, feeble pulse, hoarseness, sometimes aphonia, and even fames canina, though rarely. Continued pressure of these enlarged glands may produce atrophy in the organs thus pressed upon. At last the enlarged gland projects like a ball valve into the lumen of the trachea, bronchus, or esophagus, vena cava, or aorta, and may thus perforate one of these organs, and even such a thing

as double perforation of two organs by the same gland has been known, manifested, for instance, by cough and dyspnea after swallowing, as might happen from a perforation of both esophagus and trachea or bronchus by an excavating caseous gland. In addition to pus in the sputa, we may often find the debris of caseous glands. If they are sufficiently large they may be detected by percussion, most easily between the shoulder blades or directly behind the manubrium. Eustace Smith claims that enlargement of the bronchial glands gives rise to a characteristic bruit to be heard over the trachea if the head is held slightly retracted during auscultation. The duration of bronchial adenitis is usually very tedious unless there arise some dangerous pulmonary complication, such as a perforating pleurisy. The final result is usually either death from pulmonary phthisis or miliary tuberculosis. Goodhart believes recovery takes place more often than is generally believed is possible.

Treatment.—*Prophylactic*: Scrofulous children should be guarded from taking cold by means of proper clothes and equable temperature (respirators, when obliged to be out-of-doors during the winter). Not less important than good air is nourishing food—cream, eggs, rare beef, and meat juice.

Therapy: Cod-liver oil, either pure or in some agreeable emulsion, as with syrup of the iodid of iron, gtt. x-xx, t. i. d., stands at the head of all remedies for these children. Other forms of iron are highly spoken of by others, and the writer has obtained some remarkable results in the disappearance of chronic glandular swellings by the continued use of calcium chlorid (crystallized).

Hygienic: Salt baths and friction, either at home or at the seashore, when possible, are valuable adjuvants to other treatment for these children if they react nicely after their use, not otherwise.

10. HYDROTHORAX.

Synonym.—Dropsy of the pleura.

Etiology.—Like other dropsies, this is not a primary disease, but a symptom common to many causes, perhaps most frequently of scarlatinal nephritis, where it is usually associated with ascites and anasarca. Hydrothorax is also, though much more rarely, met

with in heart disease and the cachexia of malaria when conjoined to enlargement of the spleen. Hydrothorax is always bilateral except in those rare cases where one pleural cavity has previous adhesions over its entire extent.

Symptoms.—The same in children as in adults; pain and friction sounds are always wanting, and thus make probable the diagnosis from the earlier stages of pleurisy. Dyspnea and cyanosis are in children commensurate with the amount of the dropsical effusion, which in scarlatinal nephritis may necessitate orthopnea.

Prognosis is never favorable; somewhat better after scarlatina and worst of all in heart disease, where hydrothorax is soon followed by death. Pulmonary edema betokens speedy death.

Treatment.—The anuria of post-scarlatinal nephritis should be combated by hot or vapor baths and the free use of diuretics—infusion digitalis, liquor ammonia acetatis, or the following:—

R. Sol. pot. citratis,
 Syr. acidi citrici, . . . aa ℥ ij
 Cocain. hydrochl., gr. j. M.

SIG.—Teaspoonful every two hours in water.

or cream of tartar lemonade (℥ss to Oj), or diuretin, gr. xv. per diem, which often produces an excessive diuresis. Such choice of food should also be made as to throw the least tax upon the kidneys, while at the same time it should be nourishing. If diarrhea appears, although conservative, it should be checked if clearly weakening the strength of the child. Iron in some agreeable form is indicated after the disappearance of the dropsy.

SECTION IX.

DISEASES OF THE DIGESTIVE APPARATUS.

I. MALFORMATIONS OF MOUTH AND TONGUE.

(A) HARELIP.

Synonyms.—*Labium leporinum* ; *Wolfsrachen* ; *bec de lièvre*.

Definition.—Is an arrest of development of the embryonic inter-maxillary and superior maxillary bones, whereby they fail to unite.

Varieties.—Harelip may occur on one or both sides, either single or double, and also implicate the soft palate. In the worst cases the fissure extends from the outer third of one lip into the corresponding nostril, while in the mildest cases the lip is cleft only one-third to one-half of its width.

Fissures of Hard Palate.—The fissures of the hard palate, *palatum fissum*, are generally only unilateral, and may be so broad as to allow one readily to look into the cavity of the nose. Double uvula, or simple fissure of the uvula without fissure of the palate, or harelip, is to be regarded as an arrest of development in its simplest form, while the most marked disfigurement of the face may result from fissure of the palate complicated with double harelip. In such cases the intermaxillary bone has not united on either side with the maxillary bones and projects forward like an isolated knob or snout. The nostrils are widely and irregularly dilated and the central part of the upper lip is almost entirely wanting.

Consequences are in proportion to the degree of the deformity. In the milder cases nursing is not difficult, but in severe ones the children are unable to seize upon the nipple with their lips, but quickly learn how to nurse if the nipple is placed in the fissure. When the palate is cleft, nursing is always considerably more difficult, and especially so when the milk runs out of the nostrils, though this may be lessened by holding the head high. Later in life speech always becomes indistinct ; in harelip the labials, and in fissured palate the palatals, cannot be enunciated. If harelip is

not operated upon, a part of the teeth always grow in a faulty direction, but if harelip is successfully operated upon, it lessens the cleft of the palate.

Treatment.—If the cleft lip renders nursing difficult, the fissure should be operated upon during the first days of life, and on no account ought we to wait until the child has become enfeebled. On the other hand, when sucking is not difficult and the child is thriving, we may defer the operation until the fifth month. The operation should be performed on the child after it has been awake for a few hours and has previously taken a good quantity of nourishment. (For the particulars of this operation we refer the student to works on surgery, as we do for the operation of staphylorrhaphy for cleft palate, which, however, need not to be performed before the tenth year.)

(B) MICROSTOMA.

Definition.—Any lessening of the size of the mouth even to complete imperforation of the lips.

Etiology.—Congenital, or traumatic arising from burns or syphilitic ulcers, etc.

Occurrence.—Very rarely seen, except as result of an accident.

Treatment.—If there is complete imperforation, or if the mouth is so small that the child is unable to seize hold upon the nipple, the operation of stomatopoesis must be immediately performed.

(C) MACROSTOMA.

Synonym.—Congenital fissure of the angle of the mouth.

Treatment.—On the same principles as harelip.

Congenital fissure of the lower lip, according to Ashhurst, is also occasionally met with and requires the same kind of treatment.

(D) HYPERTROPHIA LABIUM.

Etiology.—May depend upon the existence of the scrofulous diathesis, or from the irritation produced by fissures or ulcers, and in some rare cases hypertrophy exists without any apparent cause.

Operation consists in making two transverse incisions so as to remove a sufficient slip from the thickness of the lip and then approximating the edges with delicate sutures.

Congenital tumors, cystic, erectile, etc., of the lips are occasionally

met with and should be treated as such tumors are when found elsewhere upon the body.

(E) ANCHYLOGLOTTIS ET ELONGATIO FRENULI.

Synonym.—"Tongue-tie."

Definition.—The frenum of the tongue is found as a membrane extending to the tip of the tongue. This may appear either as a thin or thickened membrane, which if too short ties down the tip of the tongue.

Symptoms.—This occasionally renders nursing difficult and the protrusion of the tongue beyond the lips impossible. Possibly it may later render speech indistinct and is popularly believed to make children dumb.

Treatment.—An operation is indicated only when nursing is difficult, but it is often performed for the peace of mind of those parents who are frightened over their "tongue-tied" children. May be easily performed as follows: Lift up the tongue with an index finger, thus making the frenum tense. Draw down the lower lip and snip with a pair of round-pointed scissors the offending frenum, but refuse to operate when the tongue can be made to pass the vermilion of the lips.

(F) ATROPHIA LINGUÆ.

Occurrence.—Atrophy affecting only one side of the tongue has been observed.

Etiology.—In Ashhurst's case was due to necrosis of the occipital, and recovered upon extraction of the sequestra.

(G) FISSURA SEU DEFECTUS LINGUÆ.

Etiology.—When the two halves of the visceral layers fail to coalesce, or unite too late, the tongue remains cleft with a longitudinal fissure sometimes confined to its tip.

(H) TRUE DEFECTUS LINGUÆ.

Definition.—Occurs when there is a failure to develop the tongue and it appears only as two wart-like bodies lying on the floor of the mouth.

Treatment.—None possible.

(1) HYPERTROPHY AND PROLAPSE OF TONGUE.

Etiology.—Any part of the tongue may be hypertrophied, so that after birth instead of lying, as usual, close to the hard palate, the tongue protrudes between the lips. It is swollen, with enlarged papillæ, and becomes purplish or brown and dry from exposure to the air. As the hypertrophy increases, not only in length but also in breadth and thickness, the prolapse also increases and nursing becomes difficult. The incisors project horizontally forward and excoriate the tongue, and by their irritation still further augment its hypertrophy. The saliva constantly dribbles out of the mouth, decomposes, and produces a disgusting odor. Articulation is always very difficult. Such hypertrophy is especially apt to be found in cretins, but it can also be acquired after convulsions, etc.

Treatment.—The projecting portion of the tongue should be removed by the galvano-cautery, or a wedge-shaped piece may be cut from the tongue.

2. RANULA.

Definition.—A semi-transparent, fluctuating, encysted tumor lying beneath the tongue.

Varieties.—(a) *True ranula*, found in the floor of the mouth, from the size of a walnut to a pigeon egg, and containing glairy, tenacious contents.

(b) *Mylohyoid*, found between the mylohyoid and buccal mucous membrane, often as large as an orange, and filled with cheesy contents.

Etiology.—The common form of ranula has thin walls, and contains a fluid somewhat resembling saliva, whence it was formerly supposed to be a dilatation of the duct of the submaxillary gland. May be so in those instances where the duct is occluded by a salivary calculus, but the majority of ranulæ appear to be distinct cysts. (Ashhurst.)

Symptoms.—If the ranula has attained some size before it is noticed, it may be large enough to crowd the tongue against the hard palate, so that nursing and swallowing are interfered with, and sometimes even breathing also becomes difficult, especially

if there is concomitant coryza, or there may be convulsive attacks of dyspnea, simulating croup.

Prognosis.—Favorable, though disease is prone to recur; rarely spontaneous cures have been known to follow suppuration.

Treatment.—If complicated with croupy attacks, operate immediately, as follows:—

Open sack sufficiently to thoroughly cauterize its inner walls, which must be repeated often enough to prevent union, except from the bottom of the sack. If this is not obtained, relapses will occur.

3. STOMATITIS CATARRHALIS.

Definition.—Simple hyperemia with increased secretion by the mucous membrane of the mouth.

Etiology.—Too hot, or otherwise irritating food or drink, dentition, or symptomatic after the use of mercury, arsenic, etc., or as a sequela of measles, scarlatina, typhoid, or acid dyspepsia with gastric catarrh.

Symptoms.—At first unnatural heat, redness and dryness, and then profuse flow of saliva, which soon becomes acid and excoriates. Slight fever, considerable restlessness and pain, and consequent unwillingness to eat.

Prognosis.—Always favorable on the removal of the cause.

Treatment.—Addition of lime-water to milk, and feeding with a spoon, if necessary, on account of pain in nursing. The bowels should be kept free ($\frac{1}{20}$ gr. calomel), and the mouth thoroughly washed, hourly, with a solution of borax or potass. chlorat. (gr. x to $\frac{1}{2}$ j rose water), preferable on a bit of absorbent cotton twisted around the end of a probe. If gastric catarrh complicates, this is to be treated according to the methods hereafter to be detailed.

Complications.—Other and more serious forms of stomatitis, especially thrush, or

4. STOMATOMYCOSIS.

Synonyms.—Thrush; sprue; soor; muguet; milnet; Mehlmund.

Definition.—A specific, yellowish-white parasitic growth upon the mucous membrane of the mouth, which has been previously irritated by acid secretions or ingesta. Exceedingly frequent.

Pathological Anatomy shows no destruction of the mucous membrane, which is merely inflamed and serves as a nidus for the growth of the fungus, *oidium albicans*.

Etiology.—During the first weeks of infancy the buccal secretions are acid, and hence this disease is very common among young infants. Also especially apt to occur from sour food. A spoiled "sugar tit," an unclean rubber nipple, a dirty nursing bottle, or sour milk (*oidium lactis*), lead to the development of the thrush fungi upon the mucous membrane, whence, possibly, it may be transferred to other persons. Thrush is very prevalent in foundling asylums and among bottle-fed babies, where it is almost invariably associated with impaired nutrition as well. More rarely met with in the last stages of wasting diseases, as phthisis, tuberculosis, and glandular degeneration with malnutrition.

Symptoms.—First a severe catarrh of the mucous membrane of the mouth and tongue, with a great hyperemia and tenderness of the parts, extending over the whole mucous membrane except that of the hard palate. The buccal secretion becomes viscid and has an acid reaction. After these conditions have lasted a varying length of time numerous white specks are found upon the reddened mucous membrane. These enlarge rapidly and may coat the whole cavity of the mouth with a thin, white membrane. At first these white specks can be separated from the underlying membrane only with difficulty, but after a few days they become loose and can easily be removed, and show under the microscope that they consist in part of epithelial cells and in part of a growth consisting of roots, branches, and sporules. This fungus may spread from the cavity of the mouth into the pharynx, esophagus, or produce hoarseness by extending into the larynx wherever cylindrical and ciliated epithelium are absent. Thrush may be communicated to any raw surface which is not kept scrupulously clean, and hence we may find it about the anus, though rarely so, of a child suffering from intertrigo. Infants having thrush cannot nurse well, hence often let go of the breast or refuse to take the bottle, and pass into a drowsy, marasmic state.

Prognosis.—If the children are strong and the cause is removed, thrush lasts about eight days. Its most frequent complication is intestinal catarrh, arising from the soured ingesta. As a

rule, when there has been a persistent diarrhea we fear a fatal result. Though the prognosis in general is good, when there is complicating diarrhea, or when the thrush is of long duration, the result is always doubtful; in the latter case because the oidium may extend into the blood-vessels and send an embolus to the brain—thrush emboli. The prognosis for thrush in the esophagus is always bad. In phthisis, etc., always bad. Statistics vastly differ, but in private practice it need not be dreaded; often fearfully prevalent in orphan asylums.

Treatment.—(1) Change the acid reactions of the buccal secretions to alkali, by means of borax or bicarbonate of soda solution 1–20, penciled every half hour over the whole mucous membrane of the mouth. (2) Avoid the use of all substances which favor the growth of fungi, as sugar or saccharine fluids, honey or syrup, etc., sugar tits, or milk. Unsweetened bouillon or oatmeal gruel with eggs are the best foods until the fungus has disappeared. (3) If the thrush extends into the esophagus and produces vomiting, paint the inside of the mouth with a solution of sulphurous acid in glycerin. Jenne prefers sulphite soda (3j–3j). Pay most careful attention to nutrition, employing a wet-nurse if necessary.

In bad cases may use nitrate of silver solution (gr. ij–3j t. i. d.), or better, swabbing with peroxid of hydrogen; ordinarily the following is efficient:—

(52)

| | | |
|----|------------------------|-------|
| R. | Pulv. borax, | 3 ss |
| | Glycerinæ, | 3 j |
| | Aquæ cin., | 3 ij. |

Prophylaxis.—Sugar-teats are always to be prohibited, and if the child has become accustomed to their use we must substitute in their place a rubber nipple, which should be cleansed frequently and thoroughly. The nipples of the nursing bottles and the bottles themselves must always be cleansed with the greatest care lest any milk should be left adherent and turn sour. Rubber nipples must be turned inside out and cleaned daily with a brush. The bottles must also be cleaned daily with a brush and sand, and when not in use they ought to be kept filled with water to which

a little bicarbonate of soda has been added. The rubber nipples ought also to be kept in the same solution, and the mouth of the child and the nipples of the wet-nurse should also be carefully cleansed with R No. 52, or warm water, after every feeding, with a bit of soft rag or absorbent cotton twisted about the finger of the nurse.

5. APHTHOUS STOMATITIS.

Synonyms.—Aphthæ; stomatitis vesiculosa.

Definition.—*ἀφθαί*, as used by Hippocrates, clearly denoted a breach of substance.

Symptoms.—After a few days of simple catarrhal stomatitis (see page 179) subepithelial exudates occur in the form of small vesicles which soon leave a shallow, painful ulcer behind. These are without odor, have a yellowish base and excavated edges, as if cut out from the mucous membrane of the mouth with a circular or ovoid punch, and heal within four to six days from their first appearance.

Prognosis.—Good, if the exciting cause is removed.

Treatment.—Sugar teats and injurious medicines must be discontinued. The roots of decayed teeth should always be removed. Liquids, and these cool, must alone be given. If during dentition nourishment is refused by the infant for several days, in such cases a few nourishing enemata must be given. Solutions of bicarbonate of soda or borax (1–20 of water) should be penciled over the mouth every half hour, to neutralize its acid secretions. Keep the mouth scrupulously clean, and use potass. chlorat freely, as Hensch regards it a specific in this disease, and it is very nearly so. Small doses of calomel night and morning are also helpful.

6. STOMATITIS ULCEROSA.

Synonyms.—Ulcerative stomatitis; Mundfäule.

Definition.—Ulceration of the gums, found only in children who have cut some of their teeth.

Etiology.—Transmission is possible, but can only take place from direct contact, or by means of children's toys, spoons, etc. Non-contagious sporadic cases may also occur from carious

teeth, calomel (stomatitis mercurialis), improper food, bad air, and during convalescence from serious diseases, especially measles.

Symptoms.—After a transient erythema of the mucous membrane of the mouth and gums, ulcers form on the latter about the teeth, accompanied sometimes with high fever. The floor of these ulcers is covered with a yellow coating and bleeds at the slightest touch. The secretion of saliva is increased while an intolerable odor, like that from rotting flesh, always accompanies this variety of stomatitis. Then the whole of the buccal mucous membrane becomes swollen, and marks of the teeth appear upon the mucous membrane of the tongue and cheeks. Later, upon the lips appear like painful ulcers, with sharply-defined, jagged edges and little inclination to heal. The lymphatic glands of the neck are always somewhat swollen. The mouth cannot be closed, but allows the copious, fetid, sero-sanguineous saliva to trickle over the chin and erode it.

Prognosis.—If the cause persists, the stomatitis may last for months; the teeth dropping out, the child becoming despondent and atrophic; since mastication and deglutition are extremely painful and difficult, thirst alone compels the child at last to drink, and then it takes a great deal at once. Recovery, however, generally takes place ultimately.

Treatment.—First of all, good air and nourishment must always be provided, with the most scrupulous cleanliness, by means of rinsing out the mouth with antiseptic solutions, and the removal of necrosed tissues by cutting or scraping. Older children may use a gargle, but whatever method is adopted, cleansing must be frequent and complete. Painting the ulcers with a solution of permanganate of potash or peroxid of hydrogen is also of value, as is also fluid extract of golden seal and glycerinæ. Internally, Starr speaks highly of potass. chlorat, in the following mixture:—

(53)

| | | |
|----|--------------------------------|-----------------|
| R. | Pot. chlorat., | gr. xlviii |
| | Acid. muriat., dil., | ℥ j |
| | Syrupi, | ℥ ss |
| | Aquæ, | q. s. ad ℥ iij. |
| | | M. |

Sig.—℥ j diluted for child of 3 years.—STARR.

7. GANGRÆNA ORIS.

Synonyms.—Noma ; Wangenbrand ; oral gangrene.

Etiology.—Nearly always occurs in children about two years of age, and generally after some severe constitutional disease, as typhoid, scarlatina, measles, dysentery, etc., or in children who have become greatly reduced, especially when living in foul air. It generally attacks but one cheek and is more frequently observed in girls than boys. Noma of the genitals, under similar circumstances, occurs much more rarely, also gangrene of the anus, vulva, or external meatus. This perhaps occasionally follows the administration of mercury, and one attack, *if survived*, predisposes to another (Gerhardt).

Symptoms.—During apparent convalescence, or in atrophic children, without any clearly marked premonitory symptoms, a circumscribed induration of a portion of the cheek is noticed. This takes place painlessly and is generally found in the neighborhood of one of the angles of the mouth ; on the underlying mucous membrane appears first an ichorous vesicle, which very soon becomes a gangrenous ulcer, of a dark reddish-brown hue. Great edema of the affected cheek and side of the neck immediately ensues, with infiltration of the lymphatic glands. The skin of the cheek, which has previously been pale, now becomes bluish over the primary induration, and the epidermis blisters and peels off. As a rule, no line of demarcation is established, but the gangrene spreads rapidly, both outward and inward, sometimes extending to the eyelids or neck. The gum and superior maxilla necrose with surprising rapidity, the teeth fall out, and there is a sanious discharge with horrible fetor.

Course.—The entire process generally reaches its acme in four to seven days ; then pyemia ensues from absorption of infectious matters. Sopor and delirium follow, and usually death takes place within two weeks, with the symptoms of hydremia. Very rarely has recovery been known to take place, then only with great deformity, on account of the destruction of tissue, secondary affections of the respiratory organs, *e. g.*, pneumonias or gangrene of the lungs may complicate.

Prognosis.—Very bad. Ninety to ninety-five per cent. die.

Treatment.—(1) Strengthen the constitution by means of wine, coffee, milk, meat, eggs, quinin, and good, pure air. (2) If possible, prevent the spreading of the gangrene by means of efficient cauterization of its boundaries with caustic potash, or fuming nitric acid two or three times a day. (3) Lessen the fetor by thorough application of a solution of permanganate of potash, iodoform and bismuth, carbolic acid, or peroxid of hydrogen. Older children can also use gargles of the same, and daily baths and change of clothing should be insisted upon.

8. PHARYNGITIS CUM TONSILLITIS.

Synonyms.—Inflammation of the pharynx and tonsils ; amygdalitis follicularis ; tonsillitis.

Etiology.—Scrofulous children are peculiarly predisposed, hereditarily, to this affection with each cold or other exciting cause. Rheumatic children the same.

Symptoms are the same as in adults. Difficulty in breathing and a sense of suffocation occur rarely, as there sometimes are also delirium and convulsions with high fever.

Prognosis.—Good.

Treatment.—Small children are unable to gargle, and consequently their necks should be rubbed with warm camphorated oil and covered with cotton batting. Warm drinks may be given frequently, and the steam atomizer used. Larger children should gargle their throats with warm mucilaginous decoctions, oatmeal gruel, etc. Their bowels should be carefully looked after, and diaphoresis should be promoted. Hoadley's gargle (p. 103) is very valuable in these cases, with the internal use of tincture of iron.

9. TONSILLITIS PARENCHYMATOSA SUPPURATIVA.

Synonym.—Abscess of the tonsils,

Etiology.—Frequently follows diphtheria or a follicular inflammation of the tonsils, which leaves their surface roughened and predisposed to the formation of an abscess from the accumulation in the lacunæ of foreign matters. Sometimes occasioned by cold, in a child predisposed to rheumatism.

Symptoms are the same as in adults, except the dyspnea is greater, and there is greater liability to attacks of suffocation.

Course.—The abscess generally breaks spontaneously about the end of the second week, discharging offensive pus, with immediate relief from dyspnea and pain. The formation of an abscess on one tonsil is often followed by a like process in the other; but simultaneous suppuration of both tonsils has not yet been observed.

Prophylaxis.—Excision of the ragged tonsil, and subsequent gargling of the throat with cold green tea after each meal.

Treatment.—If the physician is early called, as is rarely the case, he must endeavor to remove the bits of food which have been lodged in the ragged surface of the tonsil, and the incipient inflammation must be combated by cold gargles and like applications about the neck. But if the abscess has already formed, then warm gargles are to be preferred. When there is great pain or dyspnea, the tonsil should be incised, and timely incisions are always to be made when fluctuation can be detected. Should the incision fail to reach the abscess when it is deeply seated, and as all cutting here must be done cautiously on account of the internal carotid artery, which lies behind and to the outward of the tonsil, we must rest satisfied with a single incision into the tonsil, and endeavor to relieve the pain with cocain spray (four per cent.) until the abscess spontaneously discharges. Where there is a rheumatic diathesis, an initial dose of calomel, followed by salicylate of soda, will abort or greatly mitigate the attack.

10. HYPERTROPHIA TONSILLARUM.

Synonym.—Enlarged tonsils.

Occurrence, Etc.—Very frequently met with in children, especially scrofulous, and hence hereditary. Met with often as early as the second year, without acute inflammation; or this hypertrophy may follow repeated attacks of pharyngitis. In either case the uvula is pushed forward and upward; the isthmus of the fauces as well as the posterior opening of the nares are narrowed, and hence result a snuffling voice, mouth-breathing, and, from relaxation of the uvula, snoring during sleep. If the Eustachian

tube is obstructed, it interferes with hearing. In severe cases, breathing becomes difficult and quickened, and the child wears an anxious expression upon its face. Especial danger to the child is always to be feared when an attack of acute angina or diphtheritis supervenes, because then the already narrowed air-passages will be still further obstructed.

Treatment.—As long as respiration is not rendered difficult, treatment of the scrofula with cod-liver oil, syr. ferri iodid, etc., is sufficient ; but when breathing becomes labored, the pharyngeal cavity must be increased by lessening the size of the tonsils. This can be done by means of (1) puncturing them repeatedly, *e. g.*, twice a week, and afterward cauterizing the wound. (2) Extirpating at least one tonsil by means of a tonsillotome, which is the best and most rapid method, because in this way the whole operation is over before the child knows what the physician is about, and to this end the child should never be informed beforehand what is about to be done. The same operation may be performed later on the other tonsil. Sometimes one sitting for each tonsil is sufficient, but frequently the children are unruly, and we are often obliged to repeat the operation later in life, as it is often urgently required to improve articulation.

II. RETROPHARYNGEAL AND RETROESOPHAGEAL ABSCESS.

Definition.—Abscess behind the pharynx or esophagus.

Etiology.—Caries of the cervical vertebræ, or more rarely suppuration of the retropharyngeal lymphatic glands. Again, it may have an idiopathic origin, as is the case with scrofulous, tuberculous, and rachitic children.

Symptoms.—At first there is difficulty in swallowing, and to this are soon joined stiff neck, tenderness of the cervical vertebræ, and the voice becomes snuffling. Later, the head is bent strongly backward as far as possible to prevent dyspnea ; nevertheless, respiration becomes difficult and stertorous, but not whistling, as in croup, while the facial muscles twitch and speech is unintelligible. The posterior wall of the pharynx at first only reddened and somewhat swollen, soon evidently protrudes as a

fluctuating tumor, which sometimes crowds forward the uvula. Finally, the abscess opens and an enormous quantity of pus is poured forth into the mouth, and if this happens during sleep, the pus may flow down into the larynx and result possibly in suffocation.

Prognosis.—Bad, though not necessarily fatal.

Treatment.—Quiet and bits of ice. Timely incision must be employed after the abscess forms in consequence of suppuration of the lymphatic glands; but if the abscess arises from caries of the cervical vertebra, we must delay incising it until there is real danger from suffocation. After opening, lying on the back for months and iodid of iron are to be prescribed.

DISEASES OF THE ESOPHAGUS AND STOMACH.

1. MALFORMATIONS OF THE ESOPHAGUS,

Such as fistula colli congenita, stenosis of the esophagus, and diverticular pouches of the same, are sometimes met with, but are very rare, and can be remedied only by the aid of the surgeon.

2. ESOPHAGITIS

Has been described by Brush as a separate disease, characterized by heat, redness, pain in swallowing and between the shoulder blades, etc.; but when it exists it is probably merely an extension of catarrhal stomatitis, and requires the same treatment.

3. INFANTILE VOMITING AND DYSPEPSIA.

Vomiting is the natural and easiest method of relieving the child of injurious ingesta. Hence, unless associated with gastric catarrh, so long as the child does not waste, it is not a matter of serious import. But when a symptom of gastric catarrh, or symptomatic of other troubles than gastric, it deserves the careful attention of the physician. More cases of death result from neglected dyspepsia than from all other preventable causes of children's disease. Hence the importance of the subject. The reader's atten-

tion is called to the subject of artificial feeding (page 53), and he is again reminded that all foods may be divided into—

(a) Inorganic salts, or those which, having served their purpose in the economy, are excreted unchanged.

(b) Albuminoids, converted into peptones by gastric juice (pepsin), and by trypsin in alkaline media.

(c) Fats, mainly digested by pancreatin in smaller intestine; also assisted by bile and Brunner's glands.

(d) Saccharine and starchy carbohydrates, changed into glucose by saliva and intestinal juices (invertin).

Chemically, we may have a dyspepsia of any of these, but clinically, it is convenient to divide the dyspepsias of childhood into—

1. Mucous dyspepsia (Apeptic dyspepsia).
2. Acid dyspepsia (Putrid dyspepsia).
3. Intestinal dyspepsia, or that of fats, starch, etc., in the lower part of the alimentary canal.

APEPTIC DYSPEPSIA should be limited to those cases in which there is failure on the part of the child's stomach to secrete a proper quantity or quality of pepsin. This is characterized by the frequent ejection of undigested milk, either by vomiting or in the feces. Otherwise the passages may be natural, and the appetite excellent, nevertheless the child wastes and passes into a marasmic condition, not from a lack of food, but from failure to assimilate sufficient to keep up the nourishment of the body. The mother's milk may be good, perhaps too good, and yet the child does not thrive, and is very apt to fall a prey to some intercurrent disease, which a better nourished child would have successfully resisted.

Prophylaxis and Treatment.—The very name of this disease suggests its only successful treatment, viz., the addition of sufficient artificial digestants to supply the stomach's lack. These are the cases in which a reliable pepsin yields the most gratifying results. This form of dyspepsia is not as frequently met with as the others, but it is the one most amenable to treatment of them all. Apeptic dyspepsia is, as a rule, attended with gastric catarrh. Perhaps it is its most frequent cause, the abundant alkaline mucus undoubtedly neutralizing and rendering inert the peptic juices of

the stomach. In these cases the gastric catarrh requires treatment fully as much as the aepsia, which improves *pari passu* with the catarrh. Of all remedies for this we much prefer the subcarbonate or subnitrate of bismuth in ordinary cases. This is usually sufficient, but occasionally we have hastened convalescence by substituting pyrophosphate of iron for the bismuth for awhile, or when there is considerable gastric torpor trying minute doses of Fowler's solution or tinct. of *nux vomica*. German authors and teachers speak very highly of a tincture of the malate of iron in such cases, but that to be obtained in this country has no apparent advantage over the ordinary tincture of the chlorid or the lactate of iron. And, of course, all treatment is useless unless you can regulate the number and kind of feedings the child receives.

ACID DYSPEPSIA is that arising from an excess of acid in the stomach, either lactic or hydrochloric, which unduly clots the casein and produces thus, in addition, gastric catarrh, enteritis, entero-colitis, etc. This form of dyspepsia differs from that first mentioned in the acid eructations, sour vomit, and colicky pains of acid dyspepsia. The passages are too frequent, at first hard, sour, and curdy, and later, loose, copious, and inclined to become colorless.

Prophylaxis is more satisfactory than later treatment, for at first we have to do only with a chemical problem, but later with pathological changes as well. The earliest symptoms call for the free use of barley water as a diluent, or the use of Meigs' cream mixture (page 53), or the entire disuse of milk for a day or two, and the substitution of peptonized beef or mutton broth in its stead. For later complications, see Entero-colitis.

FAT DYSPEPSIA is occasionally seen, and in such cases pancreatic extract, or pancrobilin, is valuable. For other forms of intestinal dyspepsia, see Gastro-duodenal Catarrh and Affections of the Intestinal Canal.

4. CATARRHUS GASTRO-INTESTINALIS ACUTUS.

Synonyms.—Cholera infantum; epidemic cholera; acuter magendarmcatarrh; entero-colitis choleriforme.

Etiology.—Faulty nutrition of the child, especially apt to

occur in summer from sour milk, or from bad, improper foddering of the cows, or it may arise from abnormal irritation caused by fermenting food, teething, colds, or emotional excitement. Vaughan thinks all cases due to the production of tyrotoxin, a poisonous alkaloid formed by the decomposition of milk. Dr. Brush believes it a poison produced in cow's milk by over-heating, and Dr. Brunton states that the alkaloids resulting from the decomposition of albumin cause diarrhea (toxic) with the nervous symptoms of summer diarrhea (Holt).

Symptoms.—Frequently we learn that for some time the child's food, generally cow's milk, has been vomited at times, after one or two days of prodromal restlessness. Or there may suddenly occur at the onset of the disease an alteration in the stools, which may still be normal, for the first few, but are passed rapidly one after another, and contain either undigested, curdled milk, or consist of frothy masses of a strongly acidulous and penetrating odor. After this condition has lasted for several hours, or without any premonition, yellowish-green, watery stools, with a stale or sour smell, occur in great number, twenty to thirty; "rice-watery" at first and very profuse, running through napkins, and often the bed-clothes also; at last stools are tinged with blood, with simultaneous vomiting of all ingesta. As the supply of fluids discharged from the intestines, can only be procured from those of the body, viz., those contained in the blood, areolar and muscular tissue, and even the brain, whose fluids must be reabsorbed to supply the drain, this serous hemorrhage produces disturbance of circulation everywhere. The pulse becomes small and frequent, the nose and the extremities become cool, the skin and the urine scanty. The child becomes blue and pinched looking. The features become senile, the eyes hollow, the great fontanelle sinks in, and the borders of the cranial bones override each other. Very rarely, even now, a reactive fever occurs, with cure or a transformation into chronic gastro-intestinal catarrh. Generally, however, death occurs in from two to six days, with the symptoms of spurious hydrocephalus, characterized by moaning, restlessness, eyes dilated, immobility of the pupils, convulsions, dyspnea from anemia of the medulla oblongata, and marantic thrombosis of the cerebral sinuses. Or

death may result from pneumonia, which frequently arises from the passage of part of the food down the trachea (Schluck-pneumonia).

Prognosis.—Generally bad. May die in six to twelve hours, usually not for twenty-four to thirty-six. Statistics show improvement in mortality of late years or better diagnoses.

Treatment of cholera infantum. (1) Keep child in temperature below 80°, better below 70° (F.); in open air, if possible. Watch carefully diet and guard against initial diarrhea. During stages of evacuation give aromatic spirits of am. with calcined magnesia, teaspoonful every thirty minutes.

(54)

| | |
|---------------------------------|---------|
| R. Sp. am. aromatici, | 4 c.c. |
| Magnesii exsiccata, | 2 gm. |
| Aquæ anisi, | 50 c.c. |
| Tr. opii camph., | 4 c.c. |

Might substitute bismuth for the magnesia, if much vomiting. Rectal injections of chloral hydrate, giving one grain for each year of child's age, and collodion over abdomen, or hot pack, mustard, or red pepper in the bath. If this does not produce reaction, then give quinin hypodermically, with $\frac{1}{120}$ grain morphin.

Gastro-duodenal catarrh, the so-called *bilious diarrhea*, is one of the symptoms of hepatic incompetence, "biliousness," and needs treatment more by regulation of diet than by checking the diarrhea. This and the vomiting may be so annoying as to require immediate relief, which can be usually most promptly attained by the use of minute doses of calomel ($\frac{1}{12}$ to $\frac{1}{20}$) combined with bicarbonate of soda and bismuth. The after-treatment consists in the regulation of the duodenal dyspepsia and the use of such foods as will least tax this part of digestion. If this is not done, the child soon regains its appetite, eats inordinately, overtakes its hepatic secretions, and culminates matters before long with another bilious attack. The indications then are: (1) Relieve hepatic incompetence and catarrh. (2) Keep bowels regularly emptied of fermentable and undigested food. Both are well accomplished by the use of phosphate of soda or chlorid of ammonium in some such mixture as the following:—

(55)

| | | | |
|--|----------------------------|---------|----|
| R. | Sodii sulphat, | 2 gm. | |
| | Phosphate soda, | 8 gm. | |
| | Cascara cordial, | 60 c.c. | M. |
| Sig.—ȝ j-ij night and morning, as required.—H. | | | |

With regulation of the diet as before indicated—cocoa, chops, steak, toast, oysters and soups being the foods best adapted for such cases.

5. SEROUS DIARRHEA.

Synonyms.—Intestinal catarrh, without anatomical changes; acuter darmkatarrh; diarrhée catarrhale; diarrhée idiopathique.

Varieties.—Lienteric (irritative), dentition (reflex), idiopathic, symptomatic, diarrhea ablactatorium, "lienteric laiteuse" (B).

Etiology.—Nervous excitement of the muscles of intestines (Bouchut), either simply from mental impressions, reflexly, or from irritation within the tube itself (worms, curds, etc.); also critical in certain diseases, as measles, etc.

Exciting Causes.—Cold, bad hygienic surroundings, fear, anger, rachitis, suffering of protracted dentition, intestinal worms, impressions made upon nurse, eruptive fevers, wrong foods, poor nurse, weaning, suppressed eruptions, fruit, etc.

Predisposing.—Bad air, hospitals, foundling and other asylums, uncleanness, hot weather continued for several days.

Principal of these in young children is unsuitable quantity or quality of their food conjoined with hot weather, producing, according to modern theories, a good breeding-place for bacteria in and outside of the body.

Complications.—Emaciation, if diarrhea is persistent; the skin becomes leaden, face pinched, and muscles soft, and in aggravated cases the nose becomes cool and symptoms of anemia of the brain supervene.

Symptoms with a very young child are most marked at night, and consist of light sleep, frequently interrupted by cries and colic, which leads it to twist and turn and flex its thighs on abdomen. During the day the child is peevish and fretful, and appears from time to time to actually be in suffering, as the face changes in expression.

At first there is no fever, and the child nurses less eagerly but well, although it swallows less easily and often regurgitates bits of curds, while the intestinal discharges may be thin and mucous, or firm, mixed with undigested food, bits of meat, vegetables, or lumps of casein, etc. At first they are of a normal color and homogeneous, later they become greenish and thin, or gray, rice-water stools of summer diarrhea, in which case the stools are odorless, of neutral or alkaline reaction, and often ejected with great force, after which the colic generally ceases. In addition there are moderate distention of the abdomen with tenesmus and intestinal gurgling (borborygmi).

Course.—Recovery takes place more frequently than in cholera infantum; in one or two days the stools generally become more consistent, though still mixed with mucus. With others, constipation follows and the appetite improves, but if the nutrition is faulty, relapses are very prone to take place. These, at last, transform themselves into a chronic intestinal catarrh with tabes, but this may also develop itself directly from an acute diarrhea without the intervention of relapses. In such cases the mesenteric glands are never infiltrated and enlarged, or at most they are hyperemic.

Prognosis.—Favorable, if checked in two or three days; after that very prone to run into inflammatory form, so never safe to make an absolute prognosis.

Treatment.—The indications in general for the treatment of serous diarrhea in infancy are these, viz., (1) To empty the bowels. (2) Stop decomposition. (3) Restore healthy action of the intestinal canal. (4) Treat complicating lesions.

1. To remove curds and undigested food, nothing is better than castor oil (3j in hot milk, Jacobi), or small and repeated doses of calomel, if the stomach be very irritable, or by warm water enemata (Oj for child of six months, or enough to reach the ileo-cecal valve).

2. To arrest decomposition a large number of antiseptics have been proposed, and of these, according to Starr, the best are salicylate of soda, or naphthalin; one to three grains of the first every two hours (readily soluble). Naphthalin is insoluble, and has a strong odor, but can be given rubbed up with sugar of milk (gr. j-v, p. r. n.). Resorcin and bichlorid of mercury are recom-

mended by others. (One of the best is salol (gr. ij-v) combined with five to ten grains of bismuth).

(56)

R. Subnit. bismuth., gr. ij-ijj
 Pulv. Dover's, gr. $\frac{1}{3}$. M.
 SIG.—Every two to four hours for young infants.

Or—

(57)

R. Salol, gr. j
 Bismuth. subnit., gr. iv-vj.

Or—

(58)

R. Bismuth. subnitrat., gr. j-ijj
 Tinct. opii camph., gtt. iv
 Mist. cretæ,
 Aquæ anisi, aa $\frac{3}{4}$ ss. M.
 SIG.—Every two hours.

Hutchinson prefers salicylate of bismuth or chalk, gr. ij-v. Germans speak well of benzoate of soda, gr. ij-iv, pro dosi in simple elixir. A favorite prescription is—

(59)

R. Sodii bicarb., $\frac{3}{4}$ ss
 Syr. rhei aromat., $\frac{3}{4}$ ss
 Aquæ menth. pip., $\frac{3}{4}$ iiss. M.
 SIG.— $\frac{3}{4}$ j every two hours.—(STARR.)

Or—

(60)

R. Sod. bromid., 4
 Syr. rhei aromat.,
 Tinct. opii camph., aa 8 c.c.
 Aquæ anisi, ad 60 c.c. M.
 SIG.— $\frac{3}{4}$ j every two to four hours.—H.

Prophylaxis.—The intestinal discharges must be carefully examined, especially in the summer time, and their least departure from a normal condition should at once be promptly rectified by change of milk, or, at least, by the addition of a little soda bicar-

bonate. Health and habits of mothers and wet-nurses must also be carefully looked after, and changed if necessary.

Hayem thinks the green passages are contagious from the presence of bacteria, which flourish only in an alkaline or neutral medium. Experiments seem to show that lactic acid is very destructive to them, hence Hayem prescribes:—

(61)

| | | | | |
|----|---------------|-----------|---------|----|
| R. | Lactic acid, | | 2 c.c. | |
| | Simple syrup, | | 98 c.c. | |
| | Lemon juice, | | q. s. | M. |

Sig.— \mathfrak{z} j every three hours.

6. CHRONIC INTESTINAL CATARRH.

Synonyms.—Enteritis follicularis; chronic diarrhea; summer complaint; atrophía lactantium (Cheyne); entero-colitis.

Symptoms.—An acute diarrhea or an attack of cholera infantum, ending neither in death nor cure, leaves the physical forces of the body in an unsettled condition, while the discharges remain persistently thin, acrid, and gradually acquire the penetrating odor of decomposition. The anus and thighs become excoriated by the acrid discharges, and the abdomen is markedly distended and meteorismic. At the same time there is high, continuous fever and great thirst. Sometimes, after giving too much drink, vomiting results, and sometimes the appetite is very good, at times abnormally so (bulimia, polyphagia, or fames canina. The same is often observed in children suffering from intestinal worms and chronic cerebral disease). But notwithstanding this voracious appetite the child atrophies rapidly, if it has not already done so, until it looks like a skeleton with a distended, tympanitic belly. The lymphatic vessels, with their valve-like nodules about the size of the head of a pin, may often be recognized in the skin. In the atrophy the brain participates, and, in consequence, the bones of the skull override each other, *i. e.*, the parietals overlap the occipital and frontal, so that in the further progress of the disease, besides the carrion odor of the stools, the symptoms of brain atrophy and anemia (see page 50) present themselves, and, as a rule, almost without an exception, death follows soon after the

coating of the tongue with thrush, although in a few rare cases it may not take place until several weeks later.

Pathological Anatomy.—"Cut-beard" follicles, and infiltration of the submucous cellular tissue of the *whole colon* and a portion of the small intestines, the superficial surface of which shows signs of an acute catarrh in the loss of its cylindrical epithelium with abundant secretion of mucus. Moreover, many of the solitary glands and Peyer's patches are swollen and infiltrated, or have degenerated into ragged ulcers. The mesenteric glands form enlarged and infiltrated patches—red-grayish white—and show injected lacteals and chyle stains. If tuberculous, they are seen as gray or yellow granulations under the microscope. Many slough out and show actual ulceration.

Differentiation lies between incipient tuberculosis and chronic follicular enteritis; but, remember, that the former has an evening rise of temperature, while the latter may show exactly the reverse.

Treatment.—Successful treatment is more a matter of the regulation of diet and hygiene than medication, though the latter is necessary. Cleanliness is a *sine qua non* to recovery, hence an abundance of clean napkins and bathing must be insisted upon.

Diet Hints.—Cocoa is constipating in its effects and nutritious. A little fresh butter will sometimes be assimilated. Cod-liver oil is usually not well borne, hence rub it on externally. Koumiss is valuable for an irritable stomach. Beef-tea—do not give it—only stimulant, and whisky is much better. Beef-tea is a laxative, and hence do not use it, except as an occasional change. Raw or pounded beef is good. Hash finely, rub through a grater, put a little sugar on it, and a child will take it eagerly, but it (1) gives horrible fecal passages; (2) may produce tapeworms.

Prognosis.—Always serious; generally fatal. Apparent cessation of diarrhea not always hopeful, but hope on if without complications. Secondary less hopeful than primary. Worst stools are fetid, chopped spinach, with dirty-brown fluid; more consistent passages the better prognosis. If intercurrent disease appears prognosis is hopeless.

Medication.—The initiatory acute diarrhea must be quieted as quickly as possible, for if it has passed into the chronic state, only few cases can be saved, even with a wet-nurse. If a *wet-*

nurse is not to be had, then try substitutes (see page 53), but remember that "one lump of indigestible food does more hurt than all medicines help." Antacids as long as sour smell. Underwood says add aromatic astringents, like rhubarb, fld. ext. coto, tinct. catechu, or, if the progress is very slow, quinin (tannate, gr. ij, p. d.), scraped raw beef, yolk of eggs, cocoa, soups, and good old rum. Don't forget the importance of good air, for dampness is almost as bad as sudden changes to these children. As a last resource, use rectal injections of nitrate of silver or bismuth subnitrate and tinct. of opium suspended in starch water.

ILEO-COLITIS.

Definition.—Inflammation of the colon and rectum attended with bloody stools and tenesmus. (See page 113.)

Etiology.—Epidemic and sporadic, the former clearly infectious, possibly contagious. Most common between two and three years of age.

Symptoms.—Nausea, vomiting, high fever, and abdominal pains. Passages are frequent, painful, and soon mixed with pus and blood. Face anxious, tongue dry and brownish, loss of appetite and great thirst, abdomen distended, and tenesmus more and more distressing.

Prognosis.—None too favorable, even in the sporadic forms.

Treatment.—Absolute rest must be insisted upon, and the child fed on browned flour and scalded milk with cracked ice or toast water for thirst. Of remedies, the best are—

| (62) | | | |
|--------------------------------------|-------------------------------------|----------|----|
| R. | Olei ricini, | ℥ ijss | |
| | Tinct. opii deod., | ℥ viij | |
| | Pulv. acaciæ, | | |
| | Sacch. alb., aa | ℥ ij | |
| | Aq. menth. pip, | ad ℥ ij. | M. |
| SIG.—℥ j every three hours.—(STARR.) | | | |

or rectal injections containing gr. iv–v of chloral hydrate with fl. ext. ipecac suspended in starch water *immediately after a passage*. Others claim the very best results from minute doses of corrosive sublimate given every one or two hours with the food.

DISEASES OF THE LIVER, PERITONEUM, AND LOWER INTESTINAL CANAL.

1. INSUFFICIENT FORMATION OF BILIARY SECRETIONS

Is perhaps rather a symptom than a distinct disease, but it is so frequently met with in nurslings that it requires a word or two of description.

Etiology.—Artificial nourishment, especially when there is coincident dyspepsia and malassimilation of albuminoids.

Symptoms.—Without icterus. The feces are like crumbling, soft, gray, grayish-brown or yellow clay, often being discharged with great exertion, and can be shaken out of the diaper without leaving a mark behind. Generally the nutrition of the child falls away.

Treatment.—Gr. ij pulv. rhei with as much mag. usta or phosphate soda in small doses twice a day. Sometimes a change of food alone will produce an improvement; or, if a more efficient remedy is required, try

(63)

R. Podophyllin, gr. j
Alcoholis, ʒj.

gtt. iv-v on lump sugar as required, or podophyllin granules, p. r. n., or the free use of lithia water and an occasional laxative dose of phosphate of soda, will work wonders in these cases.

2. MALFORMATION OF LIVER AND GALL-BLADDER.

Of the *malformation* or arrest of development of the liver, we may note that it may be entirely absent, especially in acephalic children. Again it may be variously modified in form; *e. g.*, there may be no separation into lobes, or there may be supernumerary ones. The same may be true of the gall-bladder. In a case of congenital cleft diaphragm the liver may be found in the thoracic cavity, more rarely on the right side. In umbilical hernia—exomphalus—it lies outside of the abdomen, and where there is situs

transversus viscerum the liver, of course, lies on the left side, and it should always be remembered that the liver is relatively larger in children than in adults.

3. HEPAR ADIPOSUM.

Definition.—Fatty liver, either from infiltration or degeneration.

Pathological Anatomy.—Cell-walls uninjured, surface oily and glistening, margins rounded, doughy, and of a yellowish tint.

Occurrence.—A mild degree is always met with in the infant liver, where it is the physiological result of the child's milk diet, which has a superabundance of hydrocarbons, or after cod-liver oil given medicinally.

Etiology.—Pathologically, is always a secondary result in certain diseases tending to emaciation, as scrofulosis, pernicious anemia; fatty infiltration more frequent than fatty degeneration, and is found after tuberculosis of the various organs, rachitis, protracted diarrhea, enteritis follicularis, typhoid, syphilis, etc., its cause in these cases being a faulty assimilation of food, whereby the fat normally deposited in the subcutaneous cellular tissue is absorbed, accumulates in the blood, and is subsequently deposited. The liver is enlarged and can be detected by percussion, unless covered by inflated loops of intestine, but fatty liver never gives rise to ascites.

Symptoms.—The edges are blunted and its upper surfaces smooth. If the ramifications of the portal vein are affected by the atheromatous degeneration, we then find the familiar reticulated appearance, known as *nutmeg liver*. If the hepatic veins have also become implicated, a cross-section covers the blade of the knife with fat and shows a uniform, pale yellow surface.

Course.—If recovery from the primary disease takes place, absorption of the deposited fat occurs and the corresponding enlargement of the liver disappears.

Prognosis is really that of the primary disease, for if that is curable, the fatty liver is also.

Treatment is that of the primary disease.

4. AMYLOID DEGENERATION OF THE LIVER.

Synonyms.—Waxy liver ; lardaceous liver ; speck-leber.

Definition.—Albuminoid infiltration of the substance of the liver, causing increase in its size. This infiltrate gives with an aqueous solution of iodine a bright brownish-red reaction, the color becoming blue upon the addition of dilute sulphuric acid.

Occurrence.—Not a very infrequent disease of the liver, being found chiefly between the ages of four and fourteen years, and is always accompanied with marked increase in the size of the liver. It has been met with as early as the fifth week (Steiner), but is most frequently observed about the fifth year, and boys are apparently more subject to this disease than are girls. It is seldom confined to the liver alone, but affects the spleen, kidneys, intestinal and lymphatic glands as well.

Etiology.—According to Lawrence Johnson, amyloid degeneration of the liver is always preceded by chronic suppuration or caseous degeneration elsewhere in the body. Steiner insists that amyloid disease of the liver may exist independently, but is usually found associated with chronic suppuration. Others claim that it may result from syphilis, rachitis, or even eczema of the scalp, though the diseases that it most frequently follows are bone caries, tuberculosis, chronic pneumonia, abscess, variola, and pleurisy. In short, it may be said that whenever there is caseous degeneration or chronic suppuration in any of the organs of the body, amyloid degeneration of the liver, kidneys, or spleen is a later possible complication.

Symptoms.—Amyloid degeneration has no characteristic symptoms in its beginning other than those of preceding diseases already noted. After protracted illness from any of these causes, the patient is observed to become pale and his complexion waxy. At the same time there is emaciation, and the appetite is greatly impaired, especially as regards animal food. There is diminished secretion of the bile, and the stools in consequence are light-colored and very offensive. The liver can be felt as a smooth, hard tumor, sometimes extending to the crest of the ilium, with bluntly-rounded edges, distending the abdomen and making its cutaneous veins prominent. If there is concomitant disease of the

kidneys, there may be edema or albuminuria. If the spleen is affected, it will be found enlarged, and intestinal complications produce diarrhea and hydremia. Death usually preceded by ascites, which invariably accompanies sufficient enlargement of the liver, whose weight has been known to reach one-eighth that of the entire body.

Pathological Anatomy.—The liver is always increased in size; at times greatly so (7 lbs. 10 ozs., Steiner), and is firmer than normal in texture. Its edges are rounded, the color grayish-yellow to light brown, and its cut surface smooth and shining, and bathed with a small quantity of viscid bile. The microscope shows that the smaller blood-vessels and liver acini are filled with a transparent albuminoid substance which gives a reaction with iodine similar in appearance to that produced by adding iodine to starchy substances, whence the improper naming of this disease, amyloid degeneration. A more delicate reaction is that obtained by staining the tissues with an iodo-aniline methyl solution, which colors the amyloid infiltrate a ruby or reddish violet tint, and colors the healthy tissues bluish violet.

Treatment.—Cure, if possible, the primary disease as speedily as may be, lest amyloid degeneration appear in other organs. To this end take especial care of nutrition, employing, in addition, such drugs as potassium iodid, syrup of the iodid of iron, ammonium chlorid, or dilute muriatic acid. Quinin, iron, and country air are all valuable in improving the general nutrition.

Prognosis.—Generally unfavorable, the disease being almost always fatal, especially if dropsy has appeared. Initial amyloid degeneration accompanying diseases which are curable may disappear upon the removal of such diseases.

5. CIRRHOSIS HEPATIS

Occurs rarely in childhood, although it has been observed in the newborn. Its etiology is usually unknown, though sometimes it is due to the early use of alcohol, or malarial intoxication.

Symptoms, Prognosis, and Treatment same as in the adult.

Hepatitis Interstitialis Syphilitica.—See *Syphilis*.

Tuberculosis of the Liver.—See *Tuberculosis*.

6. DISEASES AND MALFORMATIONS OF THE SPLEEN.

Amyloid degeneration of the spleen is observed concomitantly and as a consequent of the causes which produce like degeneration of the liver and kidneys. Either the small arteries of the Malpighian tufts may be attacked and we have what is known as **sago spleen**, or the whole organ may be uniformly affected, producing the **lardaceous spleen**, in which the spleen becomes enlarged to a hard, smooth tumor easily felt. At the same time diarrhea and albuminuria are present, due to similar affections of the intestines and kidneys.

Infarctions of the spleen leading to inflammation of the same (splenitis), are certainly often of embolic origin.

Neomata (new formations) are observed in the spleen, as is miliary tuberculosis, and the very rare cases of splenic echinococci.

Splenic Lymphomata are met with in leucocythemia, in which there is an increase of white blood-corpuscles, and in pseudo-leucocythemia, with swelling of various lymphatic glands—especially cervical. Both of these conditions give an enlarged spleen with a perceptibly uneven surface. Lymphomata appear at autopsies as whitish or grayish-red tumors about the size of a pea.

Wandering spleen has been observed by Steiner in a two-year-old rachitic child; in this case the spleen at times was found in the left inguinal region and again between the umbilicus and symphysis.

7. PERITONITIS AND APPENDICITIS.

Occurrence.—Even in utero. Not infrequent with children, especially traumatic peritonitis.

Etiology.—Fetal peritonitis is due either to secondary syphilis or to septic infection from the mother in the later stages of pregnancy.

Peritonitis in infants is due to the same causes as in adults, or to umbilical phlebitis, or gangrene, which are especially prone to occur simultaneously with puerperal fever in lying-in hospitals and foundling asylums. The peritonitis of larger children arises, usually, from traumatic influences, colds, pyemia, acute exanthemata

(especially scarlet fever), intussusception, strangulated hernia, or very rarely from perforation of the stomach or intestine. Rarely also worms penetrate the intestine and pass into the peritoneum, and produce what is known as worm abscess. Gonorrhea may also produce peritonitis in the female child.

Symptoms.—Vomiting is usually one of the most marked and the earliest symptoms in acute peritonitis. The abdomen is tense and distended with meteorismus, and is painful to the touch and to all respiratory movements. Hence the patient endeavors to avoid every motion and assumes a crouching position. The feet are usually outstretched and breathing very superficial and short, in order to prevent, as far as possible, all motions of the diaphragm, which are painful. Hence breathing is very imperfect and with a short cry whenever a deep breath is taken. At the same time fever and a rapid pulse are present, while later collapse occurs. Infants refuse the breast. Their facial muscles are painfully distorted and the countenance is often cyanotic. In circumscribed, or chronic, peritonitis the pain is less, often occurring only on pressure.

Prognosis.—Fetal peritonitis frequently leads to angulation, or stenosis, of the intestine, and likewise to secondary ascites. Peritonitis of the newborn generally ends fatally in 1–3 days; very rarely the sero-purulent exudate finds exit via the still patulous *canalis vaginalis testiculi*, or by way of the umbilicus. Death may occur in older children from pyemia, tuberculosis of the peritoneum, or pneumonia. Cures have been known to result after a discharge of the purulent or sero-purulent fluid externally, or a purulent discharge may persist for years through the fistulous opening thus established, but it may be said that, in general, the prognosis of peritonitis is unfavorable. When the case is complicated with pyemia, septic infection, or intussusception, death is certain. The circumscribed peritonitis of older children, which points and discharges externally, may result in recovery.

Treatment.—Traumatic peritonitis, if the child is robust, will permit local abstraction of blood, but generally, in acute peritonitis, cold is especially indicated. As it is difficult to use ice bladders, as their pressure is painful, we must generally be content with cold applications; frozen cloths in winter. Calomel is called

for if the attack is ushered in with constipation, while opium and morphin are our main reliance against the pain and diarrhea. If vomiting supervenes, opiates can be administered by enema or subcutaneously. When the pain has somewhat diminished, but the meteorismus is still great, the whole abdomen may be coated thickly with collodion. Bits of ice for vomiting and stimulants for collapse. If it is probable that the pus will discharge externally, try to assist by cataplasms, and as soon as an accurate diagnosis of the position of the pus can be made, give exit to it by means of an incision, or, better, by antiseptic laparotomy.

The after treatment consists of warm baths and nourishing, easily-digested food, and if an incision has been made, in keeping the pus cavity well drained and frequently cleansed with some non-poisonous antiseptic solution, best, peroxid of hydrogen.

Chronic Peritonitis is sometimes met with in children, the first symptom that attracts the physician being usually ascites, for which see following section.

8. ASCITES, OR ABDOMINAL DROPSY.

Definition.—This is the name given to any dropsical transudation into the peritoneal sack. It is not a disease, but a symptom common to several, *e. g.*, disordered circulation, hydremia, or a diseased peritoneum.

Etiology.—Very frequently due to affections of (1st) the heart, especially of the tricuspid valve; (2d) of the lungs—atelectasis, emphysema; (3) of the liver—syphilitic gummata, pylephlebitis; (4th) of the spleen—malaria; or (5th) of the kidneys—as in Bright's disease, after scarlatina, with edema and hydrothorax, in consequence of hydremia. Furthermore, the pressure of the infiltrated or waxy lymphatic glands upon the inferior vena cava or portal vein may lead to the same condition, and more rarely ascites is found as a symptom of tuberculosis of the peritoneum and its resulting chronic peritonitis.

Symptoms of ascites are the same in the child as in the adult. Small effusions are better detected sitting or reclining than lying on the back. Death usually results from exhaustion or complicating diarrhea, peritonitis, or pleurisy.

Prognosis.—Not necessarily hopeless, though, as a rule, discouraging, unless the primary cause of the disease is removable. Goodhart believes that the prognosis in tubercular peritonitis is far better for the child than the adult.

Treatment.—While the effusion is small, our main reliance is to be placed in diuretics, such as acetate of potash, infusion of digitalis, or fluid extract of apocynum cannabin. As soon as anasarca appears, we must apply vapor baths and cathartics, the most reliable of which is elaterium, with tonics and iron to preserve the general health. So soon as the action of the diaphragm is interfered with, tapping should be resorted to and repeated as required, or permanent drainage, as advised by A. Caillé, employed.

9. DISEASES OF THE MESENTERIC GLANDS.

Etiology.—The mesenteric glands always become secondarily implicated in all protracted intestinal troubles, *e. g.*, may become *enlarged* in typhoid, follicular enteritis, but rarely can be recognized by palpation on account of the meteorismus generally accompanying these diseases. Moreover, these glands may undergo *caseation* with a simultaneous deposition of tubercle (see Scrofulosis and Tuberculosis), especially when previous morbid conditions—typhoid, repeated intestinal catarrh—have enlarged them, and, moreover, when they do not diminish in size with the cessation of the disease. Lastly, *amyloid degeneration* of the mesenteric gland has also been observed.

Treatment.—See Tuberculosis.

10. KOPROSTASIS.

Etiology.—Lead poisoning (from licking cards or leaden toys), or when the rectum is diseased, as from polypus or fissures. Constipation also occurs as a marked symptom in tubercular meningitis, in atrophic children—or if there is atrophy of the abdominal and intestinal musculature,—also in peritonitis (early). Constipation, found in feverish conditions, is due either to too tenacious or too scanty intestinal secretions, or from a deficient supply of fluids.

Symptoms.—A nursing ought to have two or three passages, and a child at least one daily, or the abdomen becomes distended

and the appetite impaired. At first there is meteorismus to a great degree, and if the constipation persists, the abdomen becomes tympanitic and sensitive to touch. Belching, vomiting, loss of appetite, and, in small children, convulsions are the natural consequences of habitual constipation. Nutrition always suffers. Often from pressure upon the intestinal veins a venous collateral circulation is set up in the abdominal coats. When, at last, by the strenuous exertions of the child, a passage is obtained, the stool is a hard mass, from want of intestinal secretions, or appears as clayey, grayish or light-yellow bits in the diaper.

Prognosis.—Favorable except in cases of meningeal tuberculosis, twisting or intussusception of the intestine.

Treatment.—(1) Examine for mechanical interferences. Strangulated hernia can generally be reduced by taxis. (2) Transient aid may usually be obtained by the use of lukewarm water, enemata of soap water, or cold vinegar clysters, or by soap suppositories (one inch long). To give a clyster successfully, the child must lie on its right side, so that the water injected into the sigmoid flexure may by its own weight pass into the right side of the abdomen. When the enema proves useless, either the feces are situated too high up, when the enema does not return, or if it does, without the stool, or on the other hand the feces may be impacted so low down that the enema immediately flows back. In this case the removal of the first hardened scybalæ by the finger or spoon handle can hardly be avoided; in the former, laxatives only are of use, *e.g.*, $\frac{1}{20}$ gr. calomel hourly, or milk of magnesia. (3) Endeavor by all means to discover and remove the cause of habitual constipation, since it usually lies in faulty nutrition, a change in which generally produces a successful result. Give amylaceous food as little as possible, in its stead giving beef-tea or meat, or when the children are older, baked or ripe fruit, and allow them laxative food; permit the use of fresh water, which, unfortunately, is forbidden in too many families. Medicinally try the following :—

(64)

| | | | |
|-------------------|----------------------------|---------|----|
| R. | Cascara cordial, | ℥ij | |
| | Tinct. bellad., | gtt.xv. | M. |
| Sig.—C. p. nocte. | | | |

(65)

R. Podophyllin, gr. j

Alcoholis, ʒj.

M.

SIG.—5 to 10 drops on sugar.

II. INTUSSUSCEPTION.

Synonyms.—Invagination, volvulus; darmknoten.**Definition.**—Spontaneous slipping down of a portion of intestine (intussusceptum) into the adjacent and lower portion of the same (intussusciens), as a finger of a glove may be pushed down into itself.**Occurrence.**—Most frequent in infants under one year, though, fortunately, rare. More frequent in boys than girls, and very frequently cadaveric (8-20 in a single abdomen).**Location.**—Almost invariably confined to the small intestine, at the ileo-cecal valve, though it may occur elsewhere.**Etiology.**—Unequal innervation of the muscular structure of the intestine, or disproportionate width and mobility of the two portions of the intestinal tube connected at the ileo-cecal valve. A strong peristaltic movement of a tightly contracted portion of intestine may drive it into another relaxed part, as often occurs during the death agony, and hence frequently found in autopsies, especially in those cases where the intestines have remained healthy, *e. g.*, brain diseases, etc. After protracted diarrhea it may be met with in children under a year.**Symptoms** are about the same as in the adult; the onset being always abrupt, with constipation, abdominal pains, intestinal hemorrhage, and vomiting, which at last may be fecal in character. At last comes collapse. In consequence of stenosis and the disturbance of circulation in the mesentery, edema and inflammation of the peritoneum appear, beginning at the point where one part of the intestine has slipped down into the other. Generally, if meteorismus is absent, a cylindrical, smooth tumor may be felt; if, however, it is the lower portion of the colon which has slipped into the rectum, no tumor can be felt externally, but it may be detected by the anus.**Prognosis.**—In rare cases recovery results from gangrene and

sloughing off of the intussusceptum and a complete union of the rest of the intestine where it enters into the volvulus. Or the contracted canal of the invaginated portion becomes gradually distended—wide enough to allow the passage of thin, fecal masses. Whereupon, a partial cure may take place, leaving behind chronic inflammation and stenosis of the intestines, which is a source of trouble whenever the stools become harder. On the other hand, death often occurs in 3-4 days from exhaustion, less frequently from peritonitis, inflammation of the intestine, or gangrene without adhesions.

Treatment.—Absolute rest, opium pushed to narcosis, ice applications to the abdomen, large enemata of water to free, if possible, the volvulus. Laparotomy, or the making of an artificial anus, has often led to good results, as a last resource. If recovery takes place, food must be administered for some time by enemata. Inflation by means of seltzer and rectal tube or seidlitz powders has given good results.

12. APPENDICITIS.

Synonym.—Typhlitis cum perityphlitis.

Definition.—An inflammation of the cecum and vermiform appendage, due to a stoppage of feces there, or from other causes.

Varieties.—(a) With or without ulceration of the mucous membrane. (b) Complicated with localized peritonitis.

Etiology.—Foreign bodies, such as cherry-pits, grape-stones, etc., may enter the vermiform appendage and remain there, or hardened feces may there accumulate and form local scybalæ. Any of these may cause ulceration of the mucous membrane and sometimes perforation of the vermiform appendage. In other cases an arrest of feces takes place in the cecum without participation of the vermiform appendage, or the ulceration of the same, terminating in perforation, which latter occurs frequently after traumatic injuries, as a fall, blow, etc. It is more frequent in larger children, and in boys rather than girls, and relapses are frequent in the same person.

Symptoms usually begin with sudden acute pain, located in the right iliac region. This pain is increased upon pressure,

change of position, or moving the right foot. Obstruction of the bowels, as a rule, occurs from the very beginning; later there is frequently vomiting, which is a sign of commencing ulceration, or of perforation having taken place. At first a distinct tumor, dull on percussion, may be mapped out in the right hypogastric region, but after perforation it disappears and tenderness extends over the abdomen. The whole abdomen becomes dreadfully painful, vomiting and great meteorismus supervene, and in consequence of general peritonitis death usually takes place on the third to fifth day. If, however, the intestines early form adhesions with the abdominal parietes, the contents of the tumor (feces, worms, foreign bodies, etc.) may be discharged externally.

Prognosis generally unfavorable, though a cure is possible if treatment is prompt.

Treatment.—If the case is recent, the tenderness moderate, and a distinct tumor can be felt, a prompt purgative may be given. If, on the other hand, the tenderness is already great, purgatives are contraindicated. The peritonitis must be combated by absolute rest, liquid food (lemonade, etc.), ice bags, and opium in large doses, but if perforation of the appendage and general peritonitis occur, nothing generally is of any avail. Should, however, recovery take place, the diet must be confined to liquid food and careful diet adhered to for a long time, and the bowels kept open lest a relapse occur.

13. CONGENITAL INGUINAL HERNIA.

Definition.—Although called congenital it is seldom present at birth, but produced soon after by coughing, straining, or crying, and is often associated with phimosis.

Etiology.—Due to a patulous canalis vaginalis testiculi, or more rarely of the canalis ligamenti rotundi, which allows of a forcing downward of an intestinal loop from the action of the abdominal muscles.

Symptoms.—With boys a toughish, round, soft tumor is seen extending from the internal abdominal ring into the scrotum. This tumor can be easily returned to the abdomen by pressure, being reduced with a gurgling sound. The limits of the testicle are hard

to define, but it generally lies behind and above the tumor, which consists, usually, of intestine alone, though very rarely it also contains peritoneum. With girls one labia majora is swollen, and here also the hernia can be easily reduced if retained during the interval with a proper truss.

Course.—As a rule, as the child grows older, the hernia cures itself spontaneously, if retained during the interval with a proper truss, though inflammation may bring about such adhesions between the peritoneum, intestine, and canal as to render the hernia irreducible. Strangulation is rarer than with the adult. (Guersant.)

Treatment.—(1) Prevent intertrigo, which is very prone to occur if the hernia be large, by washing the parts with extreme care after urination, and dusting with starch powder and talc. (2) The child must not be allowed to become constipated. (3) In small children the hernia must be kept reduced during sleep, and after they are a year old they should wear a truss, several of which should be kept on hand on account of their becoming wet. Wash daily with alcohol those parts which come in contact with the truss, to prevent their becoming chafed. (4) The best of nourishment always, in the hope that with the increase of adipose tissue the inguinal ring may close.

14. PROLAPSUS RECTI.

Synonyms.—Prolapse of rectum ; mastdarmfall.

Etiology.—Protracted diarrhea with atrophy ; dysentery, especially when it follows obstinate constipation, and, indeed, the latter alone may lead to prolapsus recti. Furthermore, long-continued tenesmus, due to stone in the bladder or persistent coughing (per-tussis, etc.), always lead to relaxation of the rectum.

Symptoms.—In the place of the normal anus we find a bluish-red tumor, into whose central aperture the finger can be introduced for a longer or shorter distance before meeting with the sphincter.

Prolapse of the rectum may be partial, *i. e.*, affect only the mucous membrane of the anal border, or involve a larger section. In the latter case it simulates an intussusception or invagination of the middle portion of the rectum into the lower portion, or into the anus itself.

Prophylaxis.—If prolapse has once occurred, guard against its return by prevention of diarrhea, constipation, or tenesmus (opium enemata). The chamber should be placed so high that the child's feet cannot reach the floor, for straining by abdominal muscles is thus kept within safe limits.

Ice water clysters are often valuable, and if all else fail we may use rectal tampons saturated with some such astringent as rhatany, tannin, alum, or vinegar. Jacobi advises an ointment of ext. nucis vomica (gr. x to $\bar{3}j$).

Prognosis.—Good.

Treatment.—In atrophic children, above all other things, care should be had for good nourishment, for this alone assures the success of any local treatment. A reposition of the prolapsed mucous membrane of the anal border should be made immediately after each passage. This should be performed on the child in the knee-elbow position, gently pushing back the prolapsed portion through the central opening by means of a bit of greased cloth until the finger has passed through the sphincter, whereupon the finger must be withdrawn by carefully rotating it as it is withdrawn. If there is intussusception of the middle portion of the rectum, we must try to set it free by the careful use of a cotton tampon, or the colpeurynter, but cauterization is only permissible when the rectal wall is extremely relaxed.

15. RECTAL POLYPI.

Definition.—Pedunculated, hypertrophic growths of rectal mucous membrane.

Occurrence.—After third year, and not so rarely as generally believed, as they are often mistaken for partial prolapse of rectum.

Symptoms are like those of prolapse of the rectum, viz. : pain and hemorrhage with each passage, and sometimes persisting for a while after, if the feces have been hard. Deep-seated polypi make their appearance at the anus with each passage, at first, quickly slipping back to their places. Later, when they have grown larger, they remain longer at the anal opening and their reposition causes pain.

Prognosis.—Good. Spontaneous cures, by the rupture of the

pedicle by a hard stool, seem to be frequent. The return of a polypus is not known, but the simultaneous presence of several sometimes occurs.

Treatment.—Application of a double silk thread about the pedicle immediately after a free passage is produced by means of a laxative.

16. RHAGADES ET FISSURÆ ANI.

Definition.—Fissuræ ani are small fissures of the mucous membrane of the anus in the vicinity of the sphincter ani externus.

Etiology.—Hard stools, or anal syphilis.

Symptoms.—Acute pain with every passage from the bowels, sometimes sufficient to cause convulsions before the passage. The stool is generally hard and is either coated with a little blood, or a little hemorrhage follows it, or both may occur at the same time. By pulling apart the folds of the mucous membrane about the anus, a wound, or a deeply hidden ulcer with more or less redness, can be discovered.

Treatment.—(1) Removal of the constipation by means of clysters, etc. (2) Cauterization of the denuded spot of mucous membrane with nitric acid or nitrate of silver. (3) In obstinate cases only, the forcible dilatation of the anus while under the influence of chloroform is to be recommended, with powdered iodoform as a local application to the ulcer.

17. CONGENITAL MALFORMATIONS IN THE INTESTINAL TRACT.

1. **Stenosis et atresia**, or narrowing or closure of the intestine, is not very infrequent in children, and may occur at various points, *e. g.*

2. **Entero-stenosis**—seu *Atresia interna*—is either congenital or acquired. Most frequently seen as a congenital deformity.

3. **Stenosis ani.**—See *Imperforatio ani*.

Etiology.—These *congenital cases* of narrowing or closure of the intestines can only be referred to interuterine cicatrices resulting from interuterine ulcers, or from the formation of peritoneal

bands or tumors of the intestine in utero. The stenosis is most frequently located in the duodenum at the point of junction between the ilium and colon, or at the sigmoid flexure or rectum, a few centimeters above the anus.

Symptoms consist in a failure to pass the meconium, because when the stenosis or atresia is situated high up, none is formed, and when low down the meconium cannot pass off. Soon the abdomen distends and fluids taken are rejected; if the stenosis or atresia is located high up, the ingesta are rejected as they were swallowed, but if the trouble is low down, they are thrown up mixed with meconium. Death, sometimes with convulsions, early takes place from atresia, but if it is a case of stenosis, it may be deferred up to the tenth to eleventh day.

The acquired forms may arise from these same causes or from closure of the intestinal tube by means of indigestible food, seeds, accumulation of ascarides, etc. Stenosis is frequently escapes detection until the soft, pap-like stools of the newborn are replaced by harder, when the symptoms of narrowing of the intestinal tube make their appearance, though they can usually be obviated by means of enemata and laxatives. More rarely, however, the stenosis is so great that there is no passage at all of meconium, or only after a very great effort.

Treatment.—The rectum must be dilated, preferably by means of a couple of sounds, as in fissure of the anus, or by nicking the same with a bistoury and a grooved director.

Imperforation.—Under the name of atresia seu imperforatio ani, seu recti, we understand various conditions, all of which have the same termination, viz.: occlusion of the rectum.

Etiology.—(a) Rectum ending as a blind pouch with the anus in same condition, their floors forming the membrane which occludes the rectum.

(b) The rectum may terminate at any point below the sigmoid flexure and above the internal sphincter without a blind anal pouch, the rectum being attached directly to the floor of the perineum, which gives a roundish swelling when the blind end of the rectum dilates with meconium.

(c) A blind pouch may be (normally) formed, but fail entirely to coincide with that of the intestines, of which the entire lower

colon may be wanting. There may be a narrow canal, large enough, perhaps, to admit a goose-quill, extending upward from the anus 1-3 inches, the intestinal canal terminating in a similar blind pouch a short distance above, leaving an intermediate, tolerably firm fibro-cellular diaphragm. The anus and lower rectum may be altogether absent and the gut end in a small fistulous orifice upon the inner side of bladder, urethra, vagina, anywhere in the perineum, or in the side or upon the anterior or lateral walls of the abdomen, or lead into the ductus omphalo-entericus. (Anus preternaturalis, ectopia ani.)

Prognosis.—Only favorable in the first variety, bad as a rule in the others, even after a successful operation for artificial anus.

Treatment.—If the rectum is clearly not the seat of the stenosis or atresia—diagnosed by passing elastic catheter to sigmoid flexure—then help can only be obtained by making an artificial anus.

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